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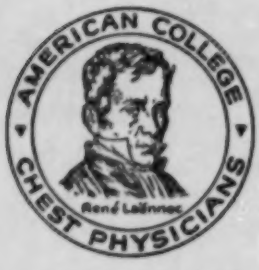
VOLUME XXVII NUMBER 1

DISEASES

of the

CHEST

OFFICIAL PUBLICATION



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AMERICAN COLLEGE OF CHEST PHYSICIANS

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112 East Chestnut Street, Chicago 11, Illinois
MURRAY KORNFELD, *Managing Editor*

VOLUME XXVII JANUARY 1955 NUMBER 1

CONTENTS

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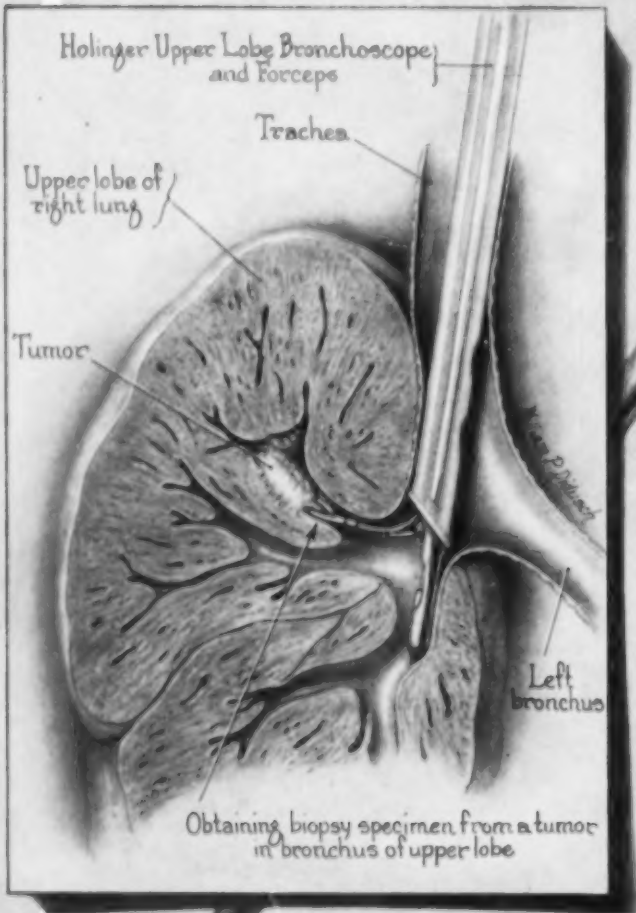

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1. Segal, M. S., et al.: Ann. Allergy 9: 782-809, 1951.

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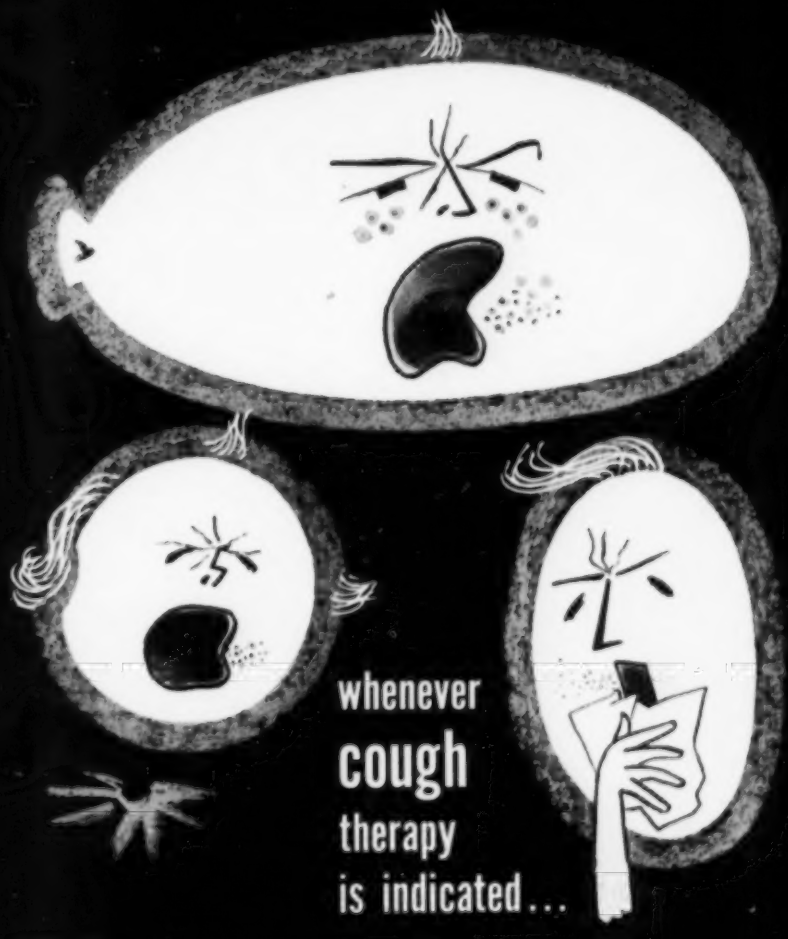

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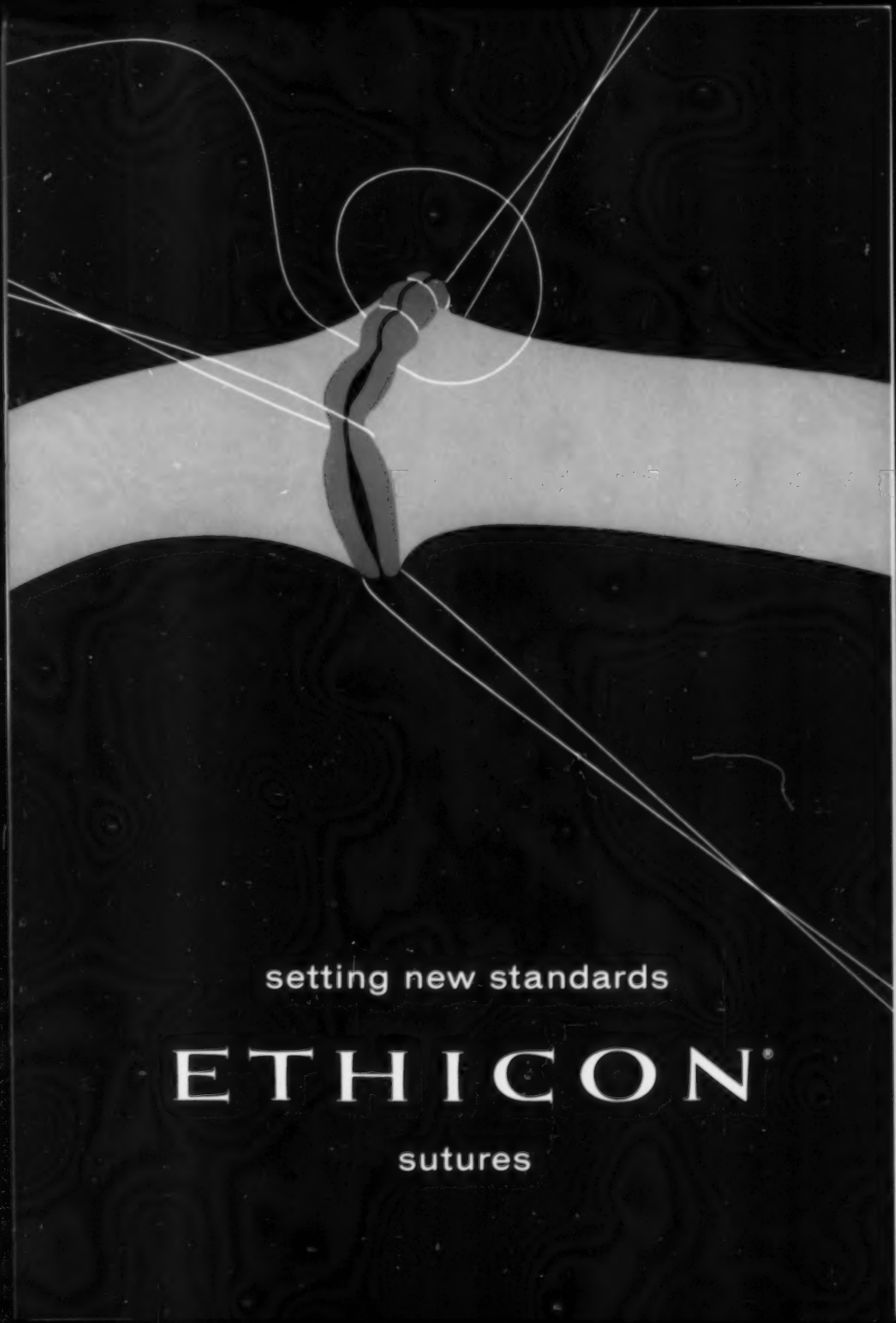
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1. Yow, E. M.; Taylor, F. M.; Hirsch, J.; Frankel, R. A., & Carnes, H. E.: *J. Pediat.* **42**:151, 1953.
2. Dodd, K.: *J. Arkansas M. Soc.* **10**:174, 1954.
3. Hanbery, J. W.: *Neurology* **4**:301, 1954.
4. Miller, G.; Hansen, J. E., & Pollock, B. E.: *Am. Heart J.* **47**:453, 1954.
5. Keefer, C. S., in Smith, A., & Wermer, P. L.: Modern Treatment, New York, Paul B. Hoeber, Inc., 1953, p. 65.

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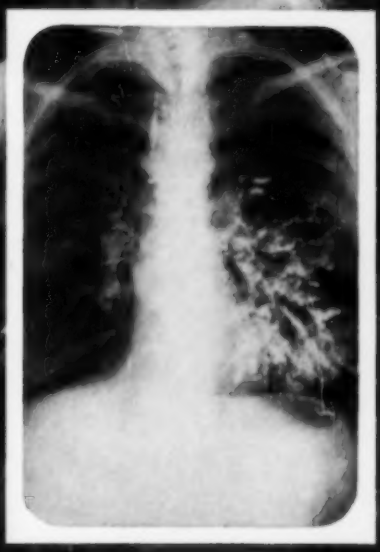

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Singer, J. J.: Differential Diagnosis of Chest Diseases. Philadelphia, Lea & Febiger, 1949, pp. 1953-4.

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DISEASES of the CHEST

VOLUME XXVII JANUARY 1955 NUMBER 1

Current Therapy in Pulmonary Tuberculosis*

A STUDY OF 10 CASES BY 100 PARTICIPATING PHYSICIANS WITH ANALYSIS OF THEIR OPINIONS

HAROLD GUYON TRIMBLE, M.D., F.C.C.P. and J. LLOYD EATON, M.D., F.C.C.P.

Oakland, California

In May 1948 the Committee on Non-Surgical Treatment of the American College of Chest Physicians started a special study to determine the type of therapy being used at that time for cases of pulmonary tuberculosis commonly seen by physicians treating diseases of the chest. Ten representative cases were selected. They were ordinary forms of tuberculosis that might be seen any day in a physician's office. They were of different races, sexes, age groups, and types of disease, with no unusual or bizarre complications. The patients had been known to us for a long time. We attempted to make the initial problem as simple as possible.

A brief case report with a reproduction of the chest x-ray film of each case was sent out with a questionnaire. Fifty-seven physicians, representing 32 states, cooperated. They were chosen as representative of the

Map: Geographical distribution of physicians participating in survey.

*A report of the Committee on Non-Surgical Treatment of the American College of Chest Physicians, 1953.
This is a condensed report. A more detailed analysis may be obtained by writing to the Committee on Non-Surgical Treatment, American College of Chest Physicians.

top clinical thinking in their area. No physicians who were primarily pathologists, roentgenologists, public health officers or hospital administrators were involved. The report of this first survey was published in Diseases of the Chest, November-December, 1948.

In March 1953 the same 10 cases were again sent to 100 physicians, including 31 who took part in the first study. They were selected by our committee because of their wide experience and high qualifications to discuss the therapy now being used in their respective areas. The accompanying map shows the geographic distribution of these specialists.

The following questionnaire accompanied each case:

I. Would you use bed rest *alone* as therapy for this type of case?
II. Would you add drug therapy?
  A. If so,
    1. When?
    2. What kind?
    3. Dosage schedule?
    4. How long?
III. Would you use collapse therapy?
  A. If so,
    1. What kind?
    2. When?
    3. How long would you expect to continue collapse?
    4. If a successful collapse, what would be your criteria for stopping it?
IV. Would you use surgery?
  A. If so,
    1. What kind?
    2. When?
    3. How long would you continue complete bed rest following surgery?
V. With the therapy you have indicated above,
  A. How long would you *expect* to keep this patient on complete bed rest?
  B. How long would you *expect* to keep such a patient in a sanatorium?
  C. What would be your criteria for discharging this patient from a sanatorium?

In general, complete bed rest has been interpreted in this survey as strict rest in bed with no bathroom privileges, although four participants said they allow bathroom privileges to patients on complete bed rest. Most of the answers have indicated "modified bed rest" when any time up has been allowed.

The dosages prescribed by those using drug therapy are discussed in Case 1. In the next nine cases we do not repeat drug dosages inasmuch as the same physicians gave practically the same dosages throughout the 10 cases, and approximately all would start chemotherapy immediately. The periods of chemotherapy varied for the different patients as described in the summary discussion.

Case Histories and Discussions

Case 1: Mr. R. V. E. (Minimal right apical lesion.) This 18 year old white male was found to have a small lesion in his right upper lung field on routine chest x-ray film during a Navy induction examination. He feels well and has no symptom. Past and family history—non-contributory. No known exposure to tuberculosis.

Physical examination negative. Intradermal tuberculin positive to 0.01 OT. Gastric lavage with guinea pig inoculation showed, at autopsy, typical tuberculous lesions from which acid-fast bacilli were recovered.

Chest x-ray film shows a small mottled infiltration at periphery of the right lung field in the first anterior interspace.

Treatment

The chart for case 1 shows a percentage comparison of the treatment specifically prescribed in 1953 with that prescribed in 1948. The qualified and indefinite answers as to therapy could not be included in the charts.

Bed rest alone: Of the nine physicians favoring bed rest alone, eight

would employ complete rest for six months or less, and six would keep him in the sanatorium for six to 12 months.

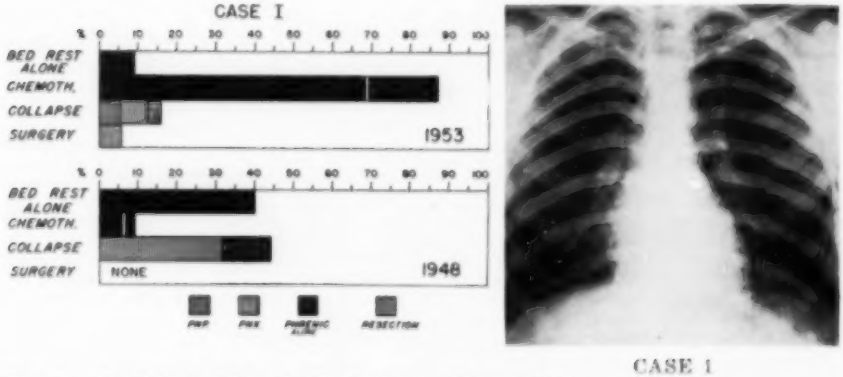
Chemotherapy: Of the 87 designating drug therapy, 85 would start it immediately. The majority specified combined intermittent SM (streptomycin) and PAS (para-aminosalicylic acid), and prescribed treatment for periods ranging from three to 18 months, more preferring 12 months. The dosage used by the greatest number was 1.0 gm. SM twice weekly or every three days plus PAS 10 to 15 gm. daily. Eleven specifically prescribe combined SM, PAS and INH (isonicotinic acid hydrazide), with dosages of SM and PAS as above while the greatest number would use a daily dosage of INH ranging from 150 to 300 mg. Here the period of prescribed treatment ranged from two to 18 months, with the largest number prescribing six to eight months. There were 28 who prescribed SM and PAS *or* SM and INH *or* PAS and INH, 11 of whom did not give their first choice although 13 specified SM and INH and four PAS and INH. The preferred dosages of SM and PAS were the same as above, and again the greatest number gave a daily dosage of INH ranging from 150 to 300 mg. The periods of treatment ranged from three months to two years, with 13 designating six to eight months.

Chemotherapy alone with bed rest: Of the 69 prescribing chemotherapy alone with bed rest, 43 would keep the patient at complete rest for six months or less, and 13 would give only "modified bed rest." Thirty-six would keep the patient in the sanatorium for from 10 to 18 months, while five would use no hospitalization.

Collapse therapy: The answers as to when collapse should be established and the length of time it should be continued were as follows:

Pneumoperitoneum—6 (one without drugs)

To be established:		*To be continued:*			
Immed.	Within 1 mo.	2 yrs.	3 yrs.	4 yrs.	Indef. answer
4	2	1	3	1	1



CASE 1

Case 1: A minimal right apical lesion in an 18 year old boy.

Chart 1: 1953—69 per cent (indicated by the white line) prescribed chemotherapy alone with bed rest.
1948—7 per cent prescribed chemotherapy alone with bed rest.

Pneumothorax right—7 (2 without drugs)

To be established:			*To be continued:*				
Immed.	Within 1 mo.	2-3 mos.	1 yr.	13-18 mos.	2 yrs.	3 yrs.	4 yrs.
4	1	2	1	1	2	2	1

Phrenic crush right—3 (2 without drugs)

To be performed:	
Immed.	2-3 mos.
2	1

Of the 16 using collapse therapy, half envisaged complete bed rest for from one to three months, and a majority would keep the patient in the sanatorium for six months or less.

Surgery: The answers as to when surgery should be performed and the length of time of complete bed rest following surgery were as follows:

Resection—6

To be performed:				*To continue complete bed rest:*	
1-2 mos.	3-4 mos.	5-6 mos.	*	2 mos.	3-6 mos.
2	1	2	1	3	3

*Would wait until maximum improvement on drugs and bed rest had been reached.

Of the six preferring resection, four would keep the patient on complete bed rest for two to three months and two for seven to nine months, while half would expect to keep him in the sanatorium six months or less and the other half for seven to 18 months.

Discussion

In this 18 year old white male with a minimal right apical lesion, with no symptoms and positive gastric lavage, nine physicians (9 per cent) would use complete bed rest alone, as compared to 40 per cent in 1948. However, if chemotherapy is included the percentages are reversed—78 per cent now compared to 47 per cent in 1948. As a corollary to this, the use of collapse therapy has dropped from 44 per cent in 1948 to 16 per cent now (including phrenics 3 per cent), the loss being nearly entirely at the expense of pneumothorax. Among the relatively few physicians now using collapse, there has been an increase in the use of pneumoperitoneum from 0 to 6 per cent, and a tremendous drop in the use of pneumothorax from 32 per cent to 7 per cent, as compared to 1948. Resection is now used by 6 per cent, and a few phrenics are still done as a primary collapse procedure.

It would seem that those favoring bed rest alone do not consider this a serious type of lesion, as nearly all would expect good results in six months or less, and half would discharge the patient from the sanatorium in six to nine months. With chemotherapy, 5 per cent would not hospitalize the patient at all and 13 per cent would not give complete bed rest. It is interesting to note that of the 69 per cent giving chemotherapy-plus-bed rest a large majority would keep the patient on complete bed rest for six months or less, although a majority would continue the sanatorium stay for 10 to 18 months. On the other hand, where pneumoperitoneum or pneumothorax is used, the period of complete bed rest is expected to be shortened to one to three months by the majority, and the sanatorium stay shortened to six months or less in most instances (as compared with the large majority estimating a 10 to 18 month sanatorium stay with chemotherapy alone plus bed rest).

The use of antimicrobial therapy has been previously discussed and needs little additional comment, other than to point out that only 8 per cent stated that they would not use drugs in this type of case. SM plus PAS is the first choice in most instances and, although there is variation in the dosage schedules of all three drugs, there is reasonable agreement in a large majority. However, there is little or no agreement as to how long the drugs should be continued.

Case 2: Mrs. J. S. (Tuberculous pneumonia.) This 31 year old white married female developed acute upper respiratory infection in January, followed by productive cough and fever. She had an hemoptysis and then visited her physician. Past history revealed a negative chest x-ray film three years previously. Another film in May of the preceding year was said to show a "spot" on her lung. For the past three to four years, she had noted weakness and easy fatigability, which she attributed to excessive menstrual flow.

X-ray film shows a diffuse homogeneous density occupying the upper half of the right lung field, containing a cavity. Sputum was positive on smear for tubercle bacilli.

Treatment

The chart for case 2 shows the treatment prescribed in 1953 and in 1948.

Chemotherapy: All of the 100 panel members would use combined chemotherapy, 99 stating they would start it immediately. Forty-two prescribed SM and PAS; 30 SM, PAS and INH; while 28 would use a combination of SM and PAS *or* SM and INH (at least 14) *or* PAS and INH (at least 2).

Chemotherapy alone with bed rest: Of the 15 prescribing chemotherapy alone with bed rest (5 of whom would possibly add pneumoperitoneum or surgery later) nine would keep her at complete rest for 10 to 18 months, and two would give only "modified rest." Ten recommended sanatorium care for 19 to 24 months.

Collapse therapy: The answers as to when collapse should be established and the length of time it should be continued were as follows:

Pneumoperitoneum—32 (3 with right phrenic crush)

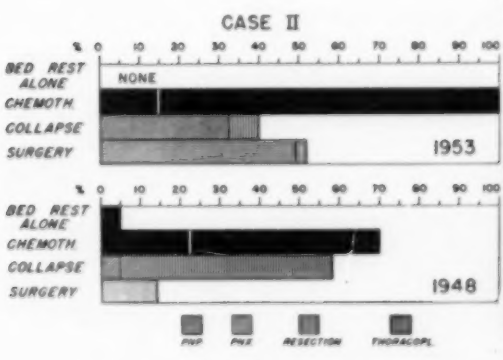
To be established:

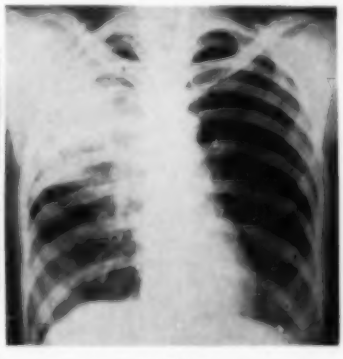
Immed.	Within 1 mo.	2-3 mos.	4-6 mos.	*	†
13	4	7	1	6	1

*as soon as toxicity and pneumonic appearance cleared
†when temperature became normal on chemotherapy

To be continued:

1 yr.	13-18 mos.	2 yrs.	3 yrs.	4 yrs.	5 yrs.	Until ready for surgery	Indef. answer
1	1	1	6	4	10	7	2





CASE 2

Case 2: Far advanced, tuberculous pneumonia in a 31 year old white woman.

Chart II: 1953—15 per cent (indicated by the white line) prescribed chemotherapy alone with bed rest.
3 per cent added phrenic crush to pneumoperitoneum.
1948—23 per cent prescribed chemotherapy alone with bed rest.
2 per cent added phrenic crush to pneumothorax.

Pneumothorax right—8

To be established:				*To be continued:*		
Immed.	Within 1 mo.	*	†	3 yrs.	4 yrs.	Indef. answer
2	3	1	2	6	1	1

*as soon as toxicity and pneumonic appearance cleared
†when temperature became normal on chemotherapy

Of the 40 using collapse therapy, 19 expected to keep her at complete rest for four to 12 months (10 designating four to six months), while a majority would expect a sanatorium stay of 18 months or less. One would use only "modified rest" and would not hospitalize her.

Surgery: The answers as to when surgery should be performed and the length of time of complete bed rest following were as follows:

Resection—49

To be performed:

1-2 mos.	3-4 mos.	5-6 mos.	7-9 mos.	10-12 mos.	13-18 mos.	*	†	Indef. answer
5	4	8	10	4	1	10	3	4

*when maximum improvement on drugs and bed rest has been reached
†when maximum improvement on pnp. and drugs has been reached

To continue complete bed rest:

"Modified"	1-2 mos.	3-4 mos.	5-6 mos.	7-9 mos.	10-12 mos.	Indef. answer
4	5	12	20	1	2	5

Thoracoplasty—3

To be performed:		*To continue complete bed rest:*	
1 mo.	5-6 mos.	3-4 mos.	5-6 mos.
1	2	2	1

Of the 52 using surgery (12 with preparatory pneumoperitoneum), 38 envisaged complete bed rest for four to 12 months (12 for four to six months and 16 for 10-12 months), and two designated only "modified bed rest." Thirty-seven expected to keep her in the sanatorium for 13 to 24 months.

Discussion

In this far advanced case of tuberculous pneumonia, in a 31 year old white female, no one would treat with bed rest alone, and there was 100 per cent agreement in the use of combined antimicrobial drug therapy. There was a much greater tendency to use all three drugs in this case and to give SM daily in the beginning, the majority using the drugs from 12 to 24 months.

The use of collapse therapy dropped from 58 per cent in 1948 to 40 per cent now, largely at the expense of pneumothorax (from 53 per cent down to 8 per cent), with a corresponding large increase in the use of pneumoperitoneum (from 5 to 32 per cent). Three years seems to be the recognized time for pneumothorax to be continued. There was much disagreement as to how long to continue pneumoperitoneum, the largest group favoring five years, but substantial numbers prescribed three and four years, and a few shorter periods.

There has been a definite increase in the use of resection (49 per cent), at the expense of thoracoplasty and collapse therapy. A substantial number would keep the patient at complete bed rest for only one to four months following resection, with few considering a longer time than six months.

With present day therapy there seems to be little change in the length of time thought necessary for complete bed rest as compared with 1948, but in both studies there is no essential agreement although the large majority would envisage 12 months or less. Seemingly with resection the sanatorium stay is increased as compared with the collapse therapy group.

Case 3: Mrs. Z. L. (Minimal, bilateral, with right pleural effusion.) This 43 year old white female, housewife and former nurse, noted the onset of easy fatigability and occasional pain in her right chest in May. These symptoms persisted and in September she began to have night sweats. On October 11th she developed acute pain in her right chest, dyspnea, chills and fever to 104° F.

X-ray film revealed a homogeneous density in the right pleural cavity (pleural effusion) and infiltration at both apices—more marked on the right.

Her mother died of tuberculosis in 1920—co-resident.

Clear yellow fluid was aspirated from the right pleural cavity. Guinea pig inoculation of this fluid was negative. Guinea pig inoculation of material obtained on gastric lavage was positive for tubercle bacilli.

Treatment

The chart for case 3 shows the treatment prescribed in 1953 and in 1948.

Chemotherapy: Ninety-eight would use combined drug therapy, 97 starting it immediately. Fifty prescribed SM and PAS; 15 SM, PAS and INH; and 33 a combination of SM and PAS *or* SM and INH (at least 14) *or* PAS and INH (at least two).

Chemotherapy alone with bed rest: Of the 74 prescribing chemotherapy alone with bed rest (five of whom would possibly add surgery later), 43 would keep her at complete rest for six months or less and 22 for 7 to 12 months. A large majority would recommend sanatorium care for 10 to 24 months.

Collapse therapy: The answers as to when collapse should be established and the length of time it should be continued were as follows:

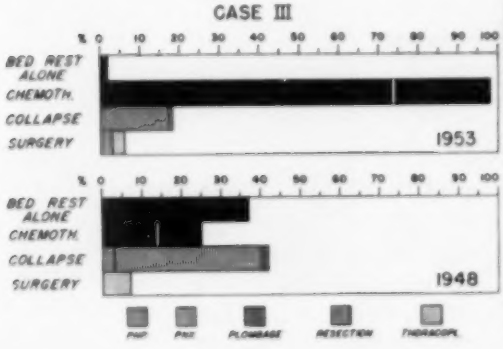
Pneumoperitoneum—17

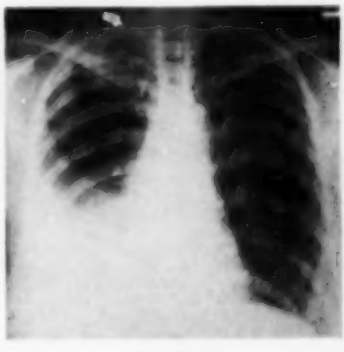
To be established:					*To be continued:*				
Immed.	Within 1 mo.	2-3 mos.	4-6 mos.	*	1 yr.	2 yrs.	3 yrs.	4 yrs.	Indef. answer
4	5	2	1	5	1	2	8	3	3

*after fluid clears with drugs and bed rest

Pneumothorax right—1

To be established: Within 1 mo. *To be continued:* 2 yrs.





CASE 3

Case 3: Minimal pulmonary tuberculosis bilateral, productive, with pleural effusion on the right, in a 43 year old white female.

Chart III: 1953—74 per cent (indicated by the white line) prescribed chemotherapy alone with bed rest.
1948—14 per cent prescribed chemotherapy alone with bed rest.

Of the 18 using collapse, the greatest number expected to keep her at complete rest for six months or less, one designating only "modified rest," while a large majority envisaged a sanatorium stay of 12 months or less.

Surgery: The answers as to when surgery should be performed and the length of time of complete bed rest following surgery were as follows:

Lobectomy right—3

To be performed:				*To continue complete bed rest:*	
2 mos.	5-6 mos.	*		3-4 mos	5-6 mos.
1	1	1		2	1

*after effusion and left side had cleared

Thoracoplasty right—3

To be performed:			*To continue complete bed rest:*		
7-9 mos.	*	Indef. answer	"Modified"	3-4 mos.	Indef. answer
1	1	1	1	1	1

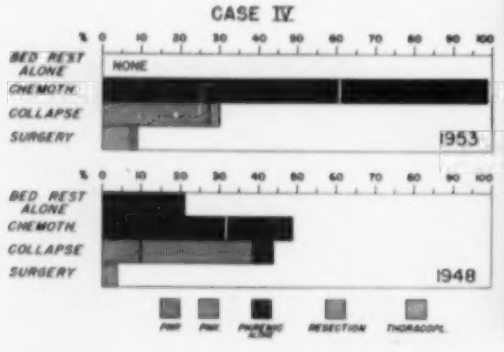
*after effusion and left side had cleared

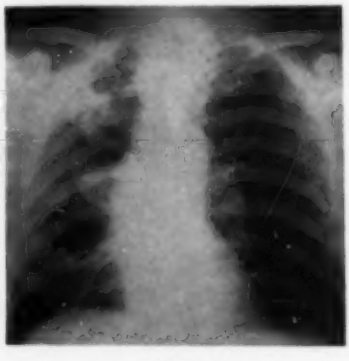
Of the six using surgery, half would expect to keep her at complete rest for seven to nine months, while the other half expected complete rest of six months or less. Half expected a sanatorium stay of 13 to 18 months.

Discussion

Practically no one would treat this pleural effusion plus minimal bilateral lesions, in a 43 year old white female, by bed rest alone. This is in marked contrast to the practice of 37 per cent in 1948. However, approximately three-fourths would use bed rest plus chemotherapy. Ninety-eight per cent would use antimicrobial therapy combined with various other methods.

There has been a marked decrease in the use of collapse therapy since 1948, largely at the expense of pneumothorax, which has dropped in favor from 37 per cent in 1948 to only 1 per cent at present. Those who favor pneumoperitoneum and drugs envisage a substantial decrease both in the amount of complete bed rest necessary and length of sanatorium stay. Most of these favor continuing pneumoperitoneum for only three years or less, which is not in accord with the facts in the literature. Whether this is





CASE 4

Case 4: Moderately advanced pulmonary tuberculosis, unilateral, no cavity, acute, in a 63 year old white male.

Chart IV: 1953—61 per cent (indicated by the white line) prescribed chemotherapy alone with bed rest.
5 per cent added phrenic crush to pneumoperitoneum.
1948—32 per cent prescribed chemotherapy alone with bed rest.
7 per cent added phrenic crush to pneumoperitoneum and 2 per cent to pneumothorax.

due to the influence of added drug therapy is not clear, although only 25 per cent used streptomycin in 1948 as compared with the present 98 per cent using combined chemotherapy. Only a few think surgery of any kind necessary in this case.

Case 4: Mr. W. N. (Moderately advanced, unilateral, acute, no cavity.) This 63 year old white male noted a productive cough, hoarseness and general run-down feeling in May. He was seen by a physician in June with the above complaints plus pain in the region of the right kidney.

Physical examination revealed rales at the right apex and right base posteriorly.

X-ray film shows an area of infiltration at the periphery of the right upper lung field, a wedgeshaped area of increased density at the right hilus and a small patchy infiltration at the right base. Sputum was positive for tubercle bacilli.

Urological study—negative right kidney. History of left nephrectomy for hydronephrosis 10 years ago. Otherwise, past and family history essentially negative.

Treatment

The chart for case 4 shows the treatment prescribed in 1953 and in 1948.

Chemotherapy: Of the 99 favoring chemotherapy, 98 would start it immediately. Fifty-three prescribed SM and PAS, one starting with SM alone; 17 SM, PAS and INH; and 29 a combination of SM and PAS *or* SM and INH (at least 12) *or* PAS and INH (at least five).

Chemotherapy alone with bed rest: Of the 61 prescribing chemotherapy alone with bed rest (nine of whom would possibly add pneumoperitoneum later, and four surgery), 24 would keep the patient at complete rest for six months or less, while nine designated only "modified rest," and 20 up to 12 months complete rest. The great majority would keep him in the sanatorium for at least one to two years: 20 for 10 to 12 months, 10 for 13 to 18 months, and 22 for 19 to 24 months.

Collapse therapy: The answers as to when collapse should be established and the length of time it should be continued were as follows:

Pneumoperitoneum—28 (with right phrenic crush—5)

To be established:

Immed.	Within 1 mo.	2-3 mos.	4-6 mos.	*
11	5	10	1	1

*after bronchoscopy to rule out tuberculous tracheobronchitis—if present, delay pneumoperitoneum until cleared on drugs

To be continued:

1 yr.	13-18 mos.	2 yrs.	3 yrs.	4 yrs.	5 yrs.	*	Indef. answer
1	1	4	8	4	5	1	4

*until ready for right thoracoplasty

Pneumothorax right—1

To be established: Immediately *To be continued:* 1 yr.

Of the 30 using collapse therapy (one extrapleural pneumothorax), about a third envisaged a period of complete rest of six months or less, while a third designated seven to 12 months. Five recommended only "modified rest." The great majority favored a sanatorium stay of from one to two years, with one stating he would possibly keep him in the sanatorium for as long as four years.

Surgery: The answers as to when surgery should be performed and the length of time of complete bed rest following surgery were as follows:

Resection—4

To be performed:		*To continue complete bed rest:*		
*	†	3-4 mos.	10-12 mos.	Indef. answer
3	1	2	1	1

*when maximum improvement on drugs was reached
†to be determined by the surgeon

Pneumonectomy right—2

To be performed:		*To continue complete bed rest:*	
Immed.	*	3-4 mos.	5-6 mos.
1	1	1	1

*when maximum improvement on drugs was reached

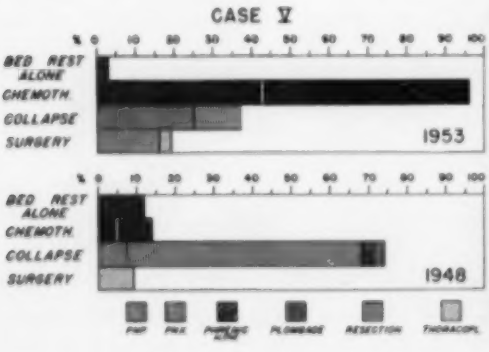
Thoracoplasty right—2

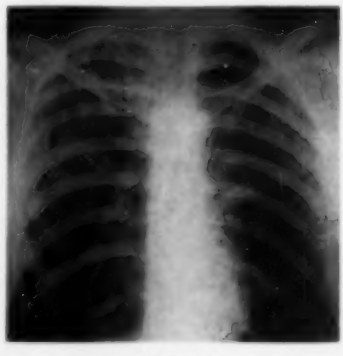
To be performed:		*To continue complete bed rest:*	
3-4 mos.	5-6 mos.	5-6 mos.	Indef. answer
1	1	1	1

Of the nine using surgery (one exploratory thoracotomy), five expected to keep him at complete rest for 10 to 12 months, and six recommended sanatorium care over a year, with two for possibly as long as two years.

Discussion

This case of moderately advanced unilateral pulmonary tuberculosis, in a 63 year old white male, follows the same pattern of treatment as outlined for the other patients thus far studied. In comparison with 1948 there is a marked decrease in those who would use bed rest alone, but a definite increase in those who would use bed rest plus chemotherapy. There is a moderate decrease in those who would add collapse therapy, but an increase in the use of pneumoperitoneum, with pneumothorax dropping from 28 per cent to 2 per cent (only two physicians using it now). Under present day therapy there is a tendency for an increase in the length of time of complete bed rest and probably of sanatorium stay. Six per cent of the panel would do resection (two pneumonectomy) for this scattered lesion in a 63 year old man, and thoracoplasty is favored by two.





CASE 5

Case 5: Moderately advanced pulmonary tuberculosis, unilateral, no cavity, fibrotic, in a 48 year old white male.

Chart V: 1953—43 per cent (indicated by the white line) prescribed chemotherapy alone with bed rest.
1948—5 per cent prescribed chemotherapy alone with bed rest.
4 per cent added phrenic crush to pneumoperitoneum.

Case 5: Mr. L. T. (Moderately advanced, unilateral, fibrotic, no cavity.) This 48 year old white male, school principal, had intermittent chest pain on the left since June one year ago. The following April he developed considerable epigastric distress and lost 10 to 15 pounds over the next few months. In October x-ray film revealed diffuse fine mottling throughout the upper half of the right lung field. Tuberculin test was positive and sputum was positive for tubercle bacilli. Excellent general condition. No other symptoms but a mild morning, slightly productive, cough.

Treatment

The chart for case 5 shows the treatment prescribed in 1953 and in 1948.

Chemotherapy: Of the 96 using combined drug therapy, 93 would start it immediately, two after one month or more of bed rest, and one would not begin drugs until several weeks before lobectomy. Forty-six prescribed SM and PAS; 11 SM, PAS and INH; and 39 a combination of SM and PAS *or* SM and INH (at least 15) *or* PAS and INH (at least three).

Chemotherapy alone with bed rest: Of the 43 prescribing chemotherapy alone with bed rest (five of whom would possibly add pneumoperitoneum or pneumothorax later, one possibly a phrenic, and two possibly resection), 22 would keep him at complete rest for six months or less, and five indicated only "modified rest." However, 20 expected a sanatorium stay of 10 to 12 months, and 15 up to two years.

Collapse therapy: The answers as to when collapse should be established and the length of time it should be continued were as follows:

Pneumoperitoneum—25

To be established:			*To be continued:*						
Immed.	Within 1 mo.	2-3 mos.	9-12 mos.	2 yrs.	3 yrs.	4 yrs.	5 yrs.	*	Indef. answer
18	6	1	1	4	10	2	1	1	6

*until ready for thoracoplasty

Pneumothorax right—12

To be established:			*To be continued:*	
Immed.	Within 1 mo.	2-3 mos.	3 yrs.	5 yrs.
6	5	1	11	1

Of the 37 using collapse therapy, 26 would keep him at complete rest for six months or less. The expected sanatorium stay was extremely varied, ranging from one to 24 months. However, 26 envisaged 12 months or less.

Surgery: The answers as to when surgery should be performed and the length of time of complete bed rest following surgery were as follows:

Resection—16

To be performed:						
Immed.	1-2 mos.	3-4 mos.	5-6 mos.	*	†	Indef. answer
1	2	3	5	3	1	1

*when maximum improvement reached on drugs and bed rest
†when lesion stabilized by pneumoperitoneum and drugs

To continue complete bed rest:					
"Modified"	1-2 mos.	3-4 mos.	5-6 mos.	10-12 mos.	Indef. answer
1	4	4	5	1	1

Thoracoplasty right—3

To be performed:			*To continue complete bed rest:*	
Immed.	10-12 mos.	†	"Modified"	3-4 mos.
1	1	1	1	2

†when lesion stabilized by pneumoperitoneum and drugs

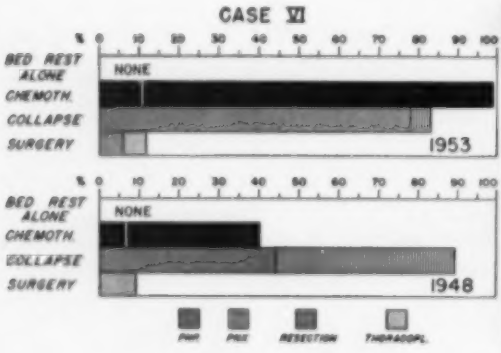
Of the 19 using surgery, 11 expected to keep him at complete rest for six months or less, and two designated "modified rest." Nine would keep him in the sanatorium for 10 to 12 months, and five for 13 to 18 months.

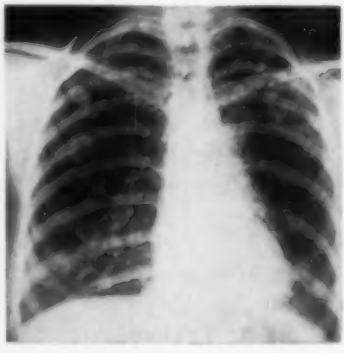
Discussion

In this case of moderately advanced disease, unilateral, fibrotic, and without cavity, in a 48 year old white male, the same trends are noted as discussed for the previous cases. The most noteworthy is the marked drop, since 1948, in the use of collapse therapy—at the expense of pneumothorax with considerable increase in the use of pneumoperitoneum. Those who would use pneumothorax would continue the collapse for three years or longer, while, surprisingly, the majority of those who would use pneumoperitoneum would continue it for three years or less. Sixteen per cent would resect.

Case 6: Mrs. F. S. (Far advanced, bilateral cavitation, probable tuberculous tracheobronchitis.) This 29 year old white married female has been underweight and easily fatigued since childhood. Seven years ago she had an upper respiratory infection and lost weight from 95 to 75 pounds. She was fluoroscoped at that time and told that she had tuberculosis but after six weeks she returned to work—no treatment. In June and again in September preceding her present illness she had pleurisy on the left, and was treated with bed rest and sulfa drugs, only until the pain and fever subsided. Now in February a third attack of pleurisy brought her to another physician. Her tuberculin test, which was said to be negative several times before, was now positive.

X-ray film at this time shows several scattered hard densities in both upper lung fields. In addition, a soft mottled infiltration at the right apex with a 1 cm. cavity in the right second anterior interspace. There is a more diffuse mottled infiltration in the upper third of the left lung field with a 3 cm. cavity at the level of the left second anterior rib. Sputum was positive for tubercle bacilli.





CASE 6

Case 6: Far advanced pulmonary tuberculosis, bilateral cavities, acute, with probable tuberculous tracheobronchitis, in a 29 year old white female.

Chart VI: 1953—11 per cent (indicated by the white line) prescribed chemotherapy alone with bed rest.
4 per cent added phrenic crush to pneumoperitoneum.
1948—7 per cent prescribed chemotherapy alone with bed rest.
12 per cent added phrenic crush to pneumoperitoneum.

Treatment

The chart for case 6 shows the treatment prescribed in 1953 and in 1948.

Chemotherapy: All of the 99 favoring combined drug therapy would start it immediately. Forty-six prescribed SM and PAS; 26 SM, PAS and INH; and 27 a combination of SM and PAS *or* SM and INH (at least 14) *or* PAS and INH (at least three).

Chemotherapy alone with bed rest: The 11 prescribing chemotherapy alone with bed rest (six of whom would possibly add surgery later) varied considerably as to the time they would expect to keep her at complete bed rest, ranging from one to 18 months. Five would keep her in the sanatorium for 19 to 24 months, three for 13-18 months, and one for possibly as long as three years.

Collapse therapy: The answers as to when collapse should be established and the length of time it should be continued were as follows:

Pneumoperitoneum—78 (with left phrenic crush—4)

To be established:

Immed.	Within 1 mo.	2-3 mos.	4-6 mos.	*
40	18	15	4	1

*when there is a negative bronchoscopy and no evidence of blocked cavity

To be continued:

6-9 mos.	1 yr.	13-18 mos.	2 yrs.	3 yrs.	4 yrs.	5 yrs.	4-6 yrs.	*	†	Indef. answer
1	2	3	11	22	10	15	1	2	3	8

*until ready for left thoracoplasty
†until ready for resection

Pneumothorax—4 (2 left, and 2 right with left thoracoplasty)

To be established:

Immed.	Within 1 mo.	Indef. answer
2 left	1 rt.	1 rt.

To be continued:

2 yrs.	2-3 yrs.	3-5 yrs.
1 left 1 rt.	1 rt.	1 left

Extrapleural pneumothorax left—1

To be established: Immediately *To be continued:* Indef. answer

Of the 83 using collapse therapy, 36 would expect to keep her at complete bed rest for 10 to 12 months, while 22 envisaged one to nine months and few for over 18 months. Fifty-five would expect to keep her in the sanatorium for over a year: 14 for 13 to 18 months, 29 for 19 to 24 months, 10 for 30-36 months, and two for possibly as long as four years.

Surgery: The answers as to when surgery should be performed and the length of time of complete bed rest following surgery were as follows:

Bilateral segmental or wedge resection—4 (with preparatory pnp.—3)

To be performed:

7-9 mos.	12 mos.	Indef. answer
1	1	2

To continue complete bed rest:

3-4 mos.	5-6 mos.	Indef. answer
1	2	1

Lobectomy left—2

To be performed:

Immed.	3-6 mos.
1	1

To continue complete bed rest:

3-4 mos.	12 mos.
1	1

Thoracoplasty left—6 (with preparatory pneumoperitoneum—2)
(with pneumothorax right—2)

To be performed:				*To continue complete bed rest:*		
3-4 mos.	7-9 mos.	18 mos. *		3-4 mos.	5-6 mos.	Indef. answer
1	1	1	3	2	3	1

*after right cavity closed

Bilateral extraperiosteal lucite plombage—1

To be performed:	*To continue complete bed rest:*
1-3 mos. after starting drugs	6-12 mos.

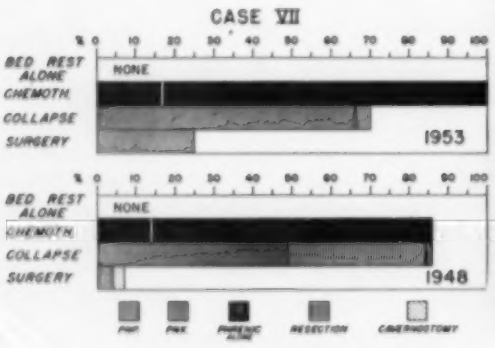
Of the 13 favoring surgery, seven would expect to keep her at complete bed rest for 12 months or longer, and one recommended only "modified rest." A majority would keep her in the sanatorium for from one and one half to three years.

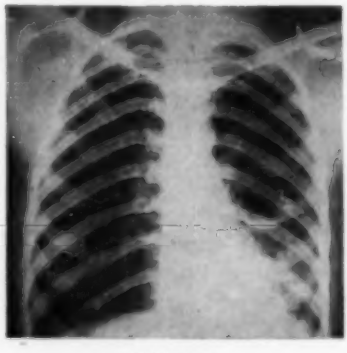
Discussion

Trends are the same in this far advanced case with bilateral cavitation, in a 29 year old white female. There are many more who would continue drugs for from 13 months to three years. About the same percentage would use collapse therapy as in 1948 (83 and 89 per cent), but pneumothorax collapse has dropped from 46 to 5 per cent, and pneumoperitoneum has gained from 43 to 78 per cent. A little more than a third would continue pneumoperitoneum for from four to six years; in year groups the largest number (22) being in the 3 year and 16 would continue it for only one to two years. There is a great difference of opinion on this point. Six would envisage resection (four bilateral), and six thoracoplasty on the left.

There is tremendous variation in the amount of complete bed rest which was thought necessary in this case, apparently about the same as in 1948. The length of sanatorium care was over 19 months in the majority of instances, some continuing it as long as four years.

Case 7: Mrs. E. B. (Far advanced, bilateral, with left cavity.) This 28 year old colored married female had frequent "colds" and an almost continuous productive cough since an attack of pneumonia in September, 18 months ago. She had casual contact with a sister who died of tuberculosis in 1942. On February sixth an x-ray film revealed mottled infiltration of miliary type throughout the entire right lung and a 4 cm. hilar cavity with an area of infiltration extending along the border of the cardiac shadow toward the base on the left. Sputum was positive for tubercle bacilli.





CASE 7

Case 7: Far advanced, bilateral pulmonary tuberculosis, with mottling throughout right and large cavity in the left hilum, in a Negro female, age 28.

Chart VII: 1953—17 per cent (indicated by the white line) prescribed chemotherapy alone with bed rest.
8 per cent added phrenic crush to pneumoperitoneum.
1948—14 per cent prescribed chemotherapy alone with bed rest.
32 per cent added phrenic crush to pneumoperitoneum and 2 per cent to pneumothorax.

Treatment

The chart for case 7 shows the treatment prescribed in 1953 and in 1948.

Chemotherapy: All of the 100 panel members would use drug therapy in this case and all would start it immediately. Forty-three prescribed SM and PAS; 34 SM, PAS and INH; and 23 SM and PAS *or* SM and INH (at least 12) *or* PAS and INH.

Chemotherapy alone with bed rest: Of the 17 prescribing chemotherapy alone with bed rest (10 of whom would possibly add surgery later), eight would expect to keep this patient at complete bed rest for 10 to 12 months. Two recommended only "modified rest," and four gave indefinite answers. All would keep her in the sanatorium for a year or longer, six envisaging 19 to 24 months and five anticipating 30 to 36 months.

Collapse therapy: The answers as to when collapse should be established and the length of time it should be continued were as follows:

Pneumoperitoneum—67 (with bronchoscopy first—3)
(with left phrenic crush—7)
(with right phrenic crush—1)

To be established:

Immed.	Within 1 mo.	2-3 mos.	4-6 mos.	*	†
37	12	11	5	1	1

*following bronchial lavage
†following lobectomy left

To be continued:

1 yr.	13-18 mos.	2 yrs.	3 yrs.	4 yrs.	5 yrs.	*	Indef. answer
4	1	6	16	11	12	6	11

*until ready for resection

Pneumothorax left—2

To be established:		*To be continued:*	
Immed.	3 mos.	3-4 yrs.	3-5 yrs.
1	1	1	1

Extrapleural pneumothorax left—1

To be established: Immediately *To be continued:* Indef. answer

Twelve of the 70 using collapse therapy added surgery. Among the other 58 the amount of expected complete bed rest varied greatly, the majority falling between one and 12 months, with 18 envisaging six months or less. The greatest number anticipated a sanatorium stay of 19 to 24 months or longer, seven designating 30 to 36 months and one four years.

Surgery: The answers as to when surgery should be performed and the length of time of complete bed rest following surgery were as follows:

Resection left—25 (with bronchoscopy first—1)
(with preparatory pneumoperitoneum—6)
(with pneumoperitoneum continued—2)
(followed by pneumoperitoneum—1)

To be performed:

1-2 mos.	5-6 mos.	10-12 mos.	13-18 mos.	*	Indef. answer
2	2	1	1	16	3

*as soon as condition of the right lung would permit

To continue complete bed rest:

"Modified"	3-4 mos.	5-6 mos.	7-9 mos.	10-12 mos.	6-24 mos.	Indef. answer
2	2	12	1	3	1	4

Of the 25 using surgery, half would expect to keep her at complete bed rest for 10 to 12 months, with seven anticipating a longer period and three designating only "modified rest." Thirteen envisaged a sanatorium stay of 19 to 24 months and one for as long as 30 to 36 months.

Discussion

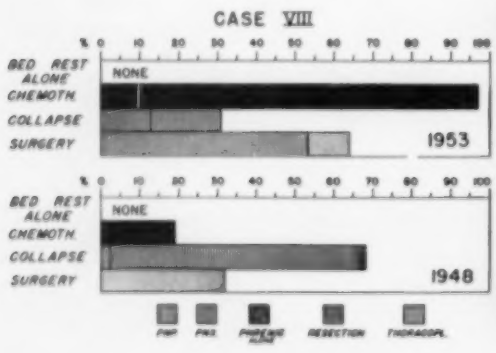
In this acute far advanced bilateral disease, in a 28 year old colored female, again all would use intermittent combined antimicrobial therapy, and most would add collapse therapy. The same marked trend toward pneumoperitoneum is apparent, pneumothorax being favored in only three instances (one extrapleural). There has been a decided decrease in the use of phrenic nerve operations since 1948. A large majority would continue pneumoperitoneum for three to five years. Again there is the marked increase in the use of resection from 3 per cent in 1948 to 25 per cent now. The greatest number would keep her at complete bed rest following surgery for six months or less. The over-all picture does not suggest that the period of bed rest or sanatorium stay has been shortened by recent developments in treatment—in fact, the reverse is suggested.

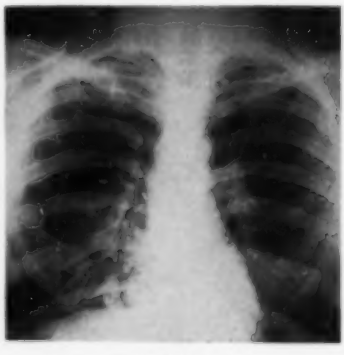
Case 8: Mr. I. A. (Moderately advanced, solitary 3 cm. cavity right apex.) This 34 year old male, shipyard worker, had occasional bilateral chest pains for four years when, following an appendectomy in January, he developed an ischiorectal abscess. On July 31st, he was rejected by the Army because of a "tuberculous cavity" in the right upper lung. On August 18th, he had a small hemoptysis followed by fever for several days. He visited a physician, and physical examination plus x-ray film revealed only a 3 cm. cavity at the right apex. Sputum was positive for tubercle bacilli.

Treatment

The chart for case 8 shows the treatment prescribed in 1953 and in 1948.

Chemotherapy: Of the 96 prescribing combined drug therapy, 95 would start it immediately. Fifty prescribed SM and PAS; 15 SM, PAS and





CASE 8

Case 8: Moderately advanced pulmonary tuberculosis, unilateral solitary 3 cm. cavity right apex, in a 34 year old white male.

Chart VIII: 1953—10 per cent (indicated by the white line) prescribed chemotherapy alone with bed rest.
1 per cent added phrenic crush to pneumoperitoneum.
1948—No one prescribed chemotherapy alone with bed rest.
2 per cent added phrenic crush to pneumothorax.

INH; and 31 SM and PAS *or* SM and INH (at least 13) *or* PAS and INH (at least four).

Chemotherapy alone with bed rest: Of the 10 prescribing chemotherapy alone with bed rest (nine of whom would possibly add surgery later), six would expect to keep him at complete bed rest for seven to nine months, while two designated only "modified rest." All but one anticipated a sanatorium stay of a year or longer, four designating 13 to 18 months, and two indicating 19 to 24 months.

Collapse therapy: The answers as to when collapse should be established and the length of time it should be continued were as follows:

Pneumoperitoneum—13 (with right phrenic crush—1)

To be established:

Immed.	3 mos.
12	1

To be continued:

6 mos.	2 yrs.	3 yrs.	5 yrs.	*	†	Indef. answer
1	2	3	2	2	2	1

*until ready for resection
†until ready for thoracoplasty

Pneumothorax right—18

To be established:

Immed.	Within 1 mo.	2-3 mos.	6 mos.	Indef. answer
7	3	6	1	1

To be continued:

1 yr.	2 yrs.	3 yrs.	4 yrs.	5 yrs.	Indef. answer
1	2	7	3	3	2

Five of the 31 using collapse therapy added surgery later. Of the remaining 26, 14 would expect to keep him at complete bed rest for nine months or less (six for seven to nine months, four from four to six months, and four for one to three months), while two designated only "modified rest." The expected sanatorium stay ranged from one to three months to 24 to 36 months, with the largest number anticipating 12 to 18 months.

Surgery: The answers as to when surgery should be performed and the length of time of complete bed rest following surgery were as follows:

Resection right—52 (with preparatory pneumoperitoneum—2)
(with pneumoperitoneum before and after surgery—1)
(with corrective thoracoplasty—4)

To be performed:

Immed.	1-2 mos.	3-4 mos.	5-6 mos.	7-9 mos.	10-12 mos.	*	Indef. answer
5	9	11	6	2	2	10	7

*after maximum drug response or when lesion has stabilized

To continue complete bed rest:

"Modified"	1-2 mos.	3-4 mos.	5-6 mos.	7-9 mos.	10-12 mos.	Indef. answer
6	6	16	15	2	1	6

Thoracoplasty right—11 (with preparatory pneumoperitoneum—2)
(possibly with resection later—1)

To be performed:

Immed.	1-2 mos.	3-4 mos.	5-6 mos.	*	Indef. answer
3	1	3	2	1	1

To continue complete bed rest:

"Modified"	3-4 mos.	5-6 mos.	Indef. answer
2	4	4	1

*as soon as general condition warrants

Of the 63 advising surgery, 32 would expect to keep him at complete bed rest for six months or less (21 designating four to six months) and six designated only "modified rest." The expected sanatorium stay ranged from one to three months to 24 to 36 months, with 27 anticipating 10 to 12 months and 15 indicating 13 to 18 months.

Discussion

In this case of moderately advanced disease with a unilateral cavity, in a 34 year old white male, nearly all would use chemotherapy. Again, there has been a definite reduction in the use of collapse therapy, from 68 per cent in 1948 to 31 per cent now. Although there has been a marked drop in the use of pneumothorax in favor of pneumoperitoneum since 1948, it is interesting to note that still 18 per cent would try right pneumothorax and continue it for three to five years in most instances. Surgery was the treatment of choice for this type of case, that is, 64 per cent of the total answers, with only 8 per cent not considering it. Fifty-two favored resection, 11 thoracoplasty, and the large majority would operate within the first six months.

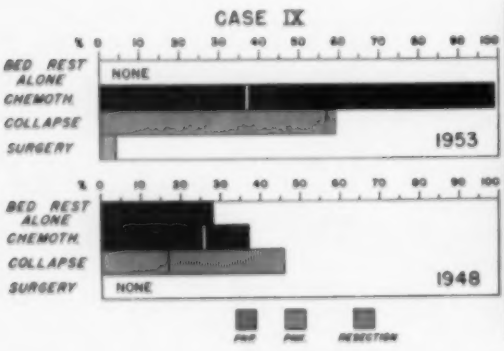
Case 9: Mrs. C. W. (Moderately advanced, bilateral, acute.) This 34 year old white married female felt well until she developed pain beneath the left scapula. She visited her physician at once, who found her intradermal tuberculin to be positive to 0.01 mg. OT. X-ray film revealed a soft mottled infiltration in both upper lung fields, more extensive on the left. Sputum was positive for tubercle bacilli.

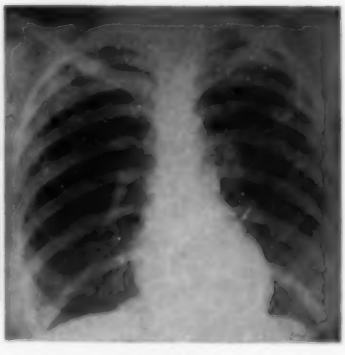
Treatment

The chart for case 9 shows the treatment prescribed in 1953 and in 1948.

Chemotherapy: Of the 99 panel members favoring combined drug therapy, 98 would start it immediately. Forty-seven prescribed SM and PAS; 16 SM, PAS and INH; and 36 SM and PAS *or* SM and INH (at least 14) *or* PAS and INH (at least four).

Chemotherapy alone with bed rest: Of the 37 prescribing chemotherapy alone with bed rest (seven of whom would possibly add pneumoperi-





CASE 9

Case 9: Moderately advanced pulmonary tuberculosis, acute, more extensive on the left, in a 34 year old white female.

Chart IX: 1953—37 per cent (indicated by the white line) prescribed chemotherapy alone with bed rest.
1948—26 per cent prescribed chemotherapy alone with bed rest.
4 per cent added phrenic crush to pneumoperitoneum.

toneum later and four possibly surgery), about half would expect to keep her at complete bed rest for six months or less (13 designating four to six months) and seven designated only "modified rest." Twelve would expect to keep this patient in the sanatorium for 10 to 12 months, eight for 13 to 18 months, and eight for 19 to 24 months, with one possibly for as long as three years.

Collapse therapy: The answers as to when collapse should be established and the length of time it should be continued were as follows:

Pneumoperitoneum—57

To be established:

Immed.	Within 1 mo.	2-3 mos.	4-6 mos.	*
34	9	4	7	3

*after bronchoscopy if findings were negative

To be continued:

1 yr.	13-18 mos.	2 yrs.	3 yrs.	4 yrs.	5 yrs.	*	Indef. answer
1	1	7	26	10	5	1	6

*until ready for resection

Pneumothorax left—2

To be established:		*To be continued:*	
Within 1 mo.	2 mos.	1-2 yrs.	2-3 yrs.
1	1	1	1

Of the 59 using collapse therapy (one of whom added surgery later and four said they would consider surgery later), 28 would expect to keep her at complete bed rest for six months or less, 24 for seven to 12 months, and two designated only "modified rest." Eighteen anticipated a sanatorium stay of 10 to 12 months, 21 for 13 to 18 months, seven for nine months or less, and six for 19 to 36 months, and six gave indefinite answers.

Surgery: The answers as to when surgery should be performed and the length of time of complete bed rest following surgery were as follows:

Resection—4 (3 probably bilateral)
(with preparatory pneumoperitoneum—1)

To be performed:		*To continue complete bed rest:*			
*	Indef. answer	"Modified"	3-4 mos.	12 mos.	Indef. answer
3	1	1	1	1	1

*when maximum benefit from drugs is obtained or when lesions are stable

Bilateral extraperiosteal lucite plombage—1

To be performed: 1-3 mos. *To continue complete bed rest*: 3-6 mos.

Of the five advising surgery, three would expect to keep the patient at complete bed rest for six months or less, while one anticipated 10 to 12 months. Four expected a sanatorium stay of 10 to 12 months, and one 13 to 18 months.

Discussion

No one at the present time would treat this moderately advanced acute bilateral disease, in a 34 year old white female, with bed rest alone, as compared to 28 per cent in 1948. However, 37 per cent would use only bed rest plus chemotherapy. There has been an increase since 1948 in the number who would use collapse therapy (from 46 to 59 per cent), with 57 per cent now favoring pneumoperitoneum. Pneumothorax

would be tried in only two instances, in contrast to 29 per cent in 1948. Only 4 per cent would consider resection as a primary procedure and extraperiosteal lucite plombage was suggested only once. Ninety-nine per cent would use chemotherapy.

Case 10: Mr. E. H. (Far advanced, bilateral fibrocaseous lesions, with cavity left.) This 57 year old white American is a sales manager. No family history of tuberculosis. No known contacts.

Past History: Pneumonia at the age of 14, and 21 years.

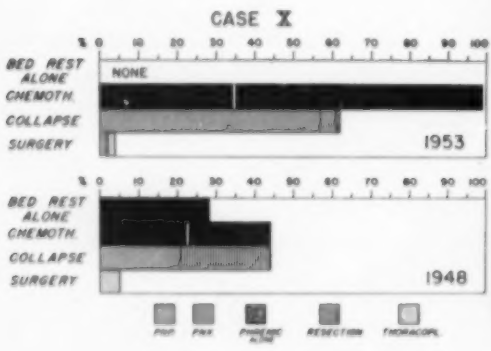
Present Illness: Two years ago he began to feel below par. Prostatitis was diagnosed and treated. Last year diagnosed "heart trouble." X-ray film finally taken, shows old calcified lesions at the right apex, multiple scattered nodules, little fibrosis, but soft infiltration throughout his right lung in the upper two-thirds. Left lung shows a soft mottling throughout the upper one-third with a 1.5 cm. cavity in the first interspace. Sputum was positive for tubercle bacilli. He was afebrile. Few chest symptoms. No other medical problem.

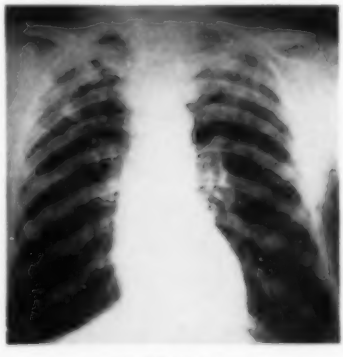
Treatment

The chart for case 10 shows the treatment prescribed in 1953 and in 1948.

Chemotherapy: Of the 99 panel members favoring combined drug therapy, 98 would start it immediately. Forty-six prescribed SM and PAS; 17 SM, PAS and INH; and 36 SM and PAS *or* SM and INH (at least 16) *or* PAS and INH (at least three).

Chemotherapy alone with bed rest: Of the 35 prescribing chemotherapy alone with bed rest (four of whom would possibly add pneumoperitoneum later and nine possibly surgery), 14 would expect to keep him at complete bed rest for 12 to 18 months, while seven anticipated six months or less, and eight designated only "modified rest." Two-thirds anticipated a sanatorium stay of over a year: six for 13 to 18 months, 13 for 19 to 24 months, and four for as long as 24 to 36 months.





CASE 10

Case 10: Far advanced pulmonary tuberculosis, fibrocaseous lesions in the upper half of both lungs with cavity left, in a 57 year old white male.

Chart X: 1953—35 per cent (indicated by the white line) prescribed chemotherapy alone with bed rest.
2 per cent added phrenic crush to pneumoperitoneum.
1948—23 per cent prescribed chemotherapy alone with bed rest.
4 per cent added phrenic crush to pneumoperitoneum and 2 per cent to pneumothorax.

Collapse therapy: The answers as to when collapse should be established and the length of time it should be continued were as follows:

Pneumoperitoneum—57 (one without drugs)
(with left phrenic crush—2)

To be established:

Immed.	Within 1 mo.	2-3 mos.	4-6 mos.	*
36	8	9	2	2

*after bronchoscopy

To be continued:

1 yr.	2 yrs.	3 yrs.	4 yrs.	5 yrs.	*	Indef. answer
3	7	25	7†	6	1	8

*until ready for resection
†one might continue collapse for 6 years

Pneumothorax left—3

To be established:		*To be continued:*	
Immed.	2 mos.	3 yrs.	*
1	2	2	1

*if not satisfactory would abandon immed.

Phrenicectomy left—1
To be performed: Immediately

Bilateral extrapleural oleothorax—1
To be established: after 4 mos. drugs *Keep on strict bed rest:* 6 mos.

Of the 62 using collapse therapy (one of whom did resection later and 14 would consider surgery later), 26 would expect to keep him at complete bed rest for six months or less (19 designating four to six months), while 23 anticipated up to 12 months, and four designated only "modified rest." The greatest number anticipated a sanatorium stay of over a year: 16 for 13 to 18 months, 16 for 19 to 24 months, and six for 24 to 36 months.

Surgery: The answers as to when surgery should be performed and the length of time of complete bed rest following were as follows:

Resection left—2 (with preparatory pneumoperitoneum—1)

To be performed:		*To continue complete bed rest:*	
*	Indef. answer	2 mos.	Indef. answer
1	1	1	1

*when right side clears on drugs and bed rest

Thoracoplasty left—1 (with paraffin pack on right)
To be performed: 2 mos. *To continue complete bed rest:* Indef. answer

Bilateral extraperiosteal lucite plombage—1
To be performed: 1-3 mos. *To continue complete bed rest:* 6-12 mos.

The period of complete bed rest expected by the four advising surgery ranged from four to six months to 10 to 12 months, with two anticipating a sanatorium stay of 13 to 18 months, one 10 to 12 months, and one gave an indefinite answer.

Discussion

In this case of far advanced pulmonary tuberculosis with cavitation and bilateral fibrocaseous disease, in a 57 year old white male, no one would now use bed rest alone, but 35 per cent would treat with bed rest and chemotherapy only. Again, practically everyone would use combined intermittent drug therapy, but 62 per cent would add collapse therapy, which is a marked increase over the practice in 1948, when only 21 per cent used chemotherapy plus collapse therapy. Again, by far the greatest number would use pneumoperitoneum, with only 3 per cent advocating pneumothorax.

Few consider this a case for surgery of any kind, neither phrenic operation, lucite plombage or extrapleural pneumothorax, resection, nor thoracoplasty. Where pneumoperitoneum is used the period of complete bed rest considered necessary is materially shorter in a majority of answers than in the group using chemotherapy alone with bed rest.

DISCUSSION

Antimicrobial therapy is now generally accepted by the vast majority of chest physicians as part of the routine treatment of pulmonary tuberculosis, whatever the extent of the disease. Ninety-seven per cent used such therapy as part of the basic treatment, with variation according to the extent of the disease only from 93 per cent for minimal disease to 99.5 per cent for far advanced disease. The drugs of choice were limited to streptomycin (SM), para-aminosalicylic acid (PAS), and isonicotinic acid hydrazide (INH). Practically all used combined and continuous therapy, with a marked preference for SM plus PAS. A majority favored the intermittent use of SM in a dosage of 1.0 gm. twice weekly, with PAS by mouth to tolerance, about 12 gm. daily. There was less agreement about INH dosage, which varied from 3 mg./kg. of body weight to 10 mg./kg., with a majority using 3 to 5 mg./kg. In the more acute far advanced cases there was a definite trend toward combining all three drugs. The preceding data show a trend toward standardization in the use of antimicrobial therapy, but when the length of time such therapy should be continued is studied, no pattern evolves. There are recommendations for courses of from one month all the way to continuous therapy for three years. In minimal and moderately advanced disease a majority thought in terms of one year or less, with a considerable number less than eight months; while in far advanced disease a majority would continue the drugs for from one to two years. However, in both instances, there were many recommendations that these broad generalizations would not cover.

As a corollary to the above, there are now few who use bed rest alone in the treatment of pulmonary tuberculosis—only 1 per cent of the total reporting, and in only 5.5 per cent of 200 answers on the only group in which it is used to any extent, minimal disease.

However, 37 per cent of the group as a whole favored antimicrobial therapy plus bed rest as the treatment of choice. This percentage was made up largely from the answers on the treatment of minimal disease, in which nearly three-quarters of the group favored that therapy, and the remainder from two of the moderately advanced cases (cases 4 and 5). These were both unilateral cases without cavitation, one acute in a 63 year old white male and the other fibrotic in a 48 year old white male. One might hazard an opinion that it was the factor of the disease being unilateral without cavitation which influenced this decision. In the two minimal and two moderately advanced cases (4 and 5), no direct comparison can be made with the previous answers in 1948, except that the use of bed rest plus drugs and without collapse therapy has tremendously increased, at the expense of collapse therapy. In the remaining cases, with exception of case 2 (tuberculous pneumonia), the use of bed rest plus drugs without collapse and/or surgery has shown some increase.

Medical collapse therapy was advised, in addition to bed rest and drugs, as a primary procedure in 42 per cent of the total answers, varying from only 17 per cent in minimal disease to 57.5 per cent in far advanced. Of the 37.5 per cent who favored collapse in the four moderately advanced cases, the largest single number came from case 9, a bilateral acute disease in a 34 year old white female. Again in comparison with the answers in 1948, there has been a definite reduction of those who would use collapse therapy in the minimal cases and the moderately advanced case 4 in favor of chemotherapy plus bed rest, and in moderately advanced case 5 in favor of chemotherapy plus bed rest and resection. In addition, there has been a decrease in the use of collapse, largely in favor of resection, in case 8 (moderately advanced, unilateral solitary 3 cm. cavity) and in case 2 (tuberculous pneumonia). In comparison with the figures in 1948, the amount of collapse recommended in the other four cases (moderately advanced case 9 and far advanced cases 6, 7 and 10) has remained about the same or has increased. These are essentially the bilateral cases.

It is noteworthy that pneumothorax has decreased in use, from the collapse therapy of choice for the large majority in 1948 to only 6 per cent at present. The one case in which it was advised to any extent was case 8 (the isolated upper lobe 3 cm. cavity). On the other hand, pneumoperitoneum has increased from a small figure in 1948 to a present 35 per cent. Phrenics and extrapleural procedures were advised rarely in any of these commonly seen 10 cases.

When collapse was used, it was initiated from immediately to within three months by the great majority. In the few advising pneumothorax, there was considerable agreement that the collapse should be continued for at least three years. On the other hand, there was little agreement as to how long pneumoperitoneum should be continued, but more than half visualized a period of from one to three years only.

Excision surgery and thoracoplasty were under consideration as a primary procedure in 20 per cent of the total 1000 answers. This was largely made up of excision surgery, as thoracoplasty has fallen in favor to a low point indeed (3 per cent). The only case in which thoracoplasty was considered to any extent was case 8 (isolated upper lobe 3 cm. cavity) in which 11 per cent favored the procedure. The total of 17 per cent for excision surgery came largely from two cases: the moderately advanced case 8 and case 2 (tuberculous pneumonia), in which its use was suggested by 52 per cent and 49 per cent respectively. In only two other cases was even a moderate use of excision visualized as necessary. These were case 5 (moderately advanced unilateral disease without cavity, in a 48 year old white male) and case 7 (far advanced bilateral with mottling scattered throughout right and large cavity in left hilum, in a 28 year old Negro woman).

As brought out by the above, when one reads a current paper on the surgery of pulmonary tuberculosis or hears a surgeon speak on the subject, it is well to remember that he is still talking about a select and well-

screened group of patients. This is a point that the surgeon himself does not emphasize as a rule.

In the above cases of excision surgery, a majority would operate in four months or less in cases 5 and 8, in nine months or under in case 2 (tuberculous pneumonia), and when the right lung would allow in case 7. Following surgery, a large majority would keep the patient on bed rest for six months or less.

Again considering this group of 10 cases as a whole, the answers to the questions on the length of time of complete bed rest and sanatorium stay were extremely varied between cases, as would be expected, and even in each case itself. It does seem that more of the few who would add pneumoperitoneum to the treatment of minimal cases visualized a shorter period of sanatorium care than did those who used chemotherapy alone with bed rest. The same is true in some other cases, particularly the far advanced group and in moderately advanced case 5. However, except for minimal case 1, and those instances in minimal case 3 and moderately advanced case 5 where pneumoperitoneum was added to the treatment, a majority would keep the patient in the sanatorium for from 12 to 24 months. There is some suggestion that, under present day therapy, the length of sanatorium stay has lengthened since 1948.

Treatment of choice for commonly seen types of pulmonary tuberculosis: The treatment of choice for the various types of pulmonary tuberculosis seen in these 10 cases, in the opinion of a majority of the 100 consultants in their 1000 answers, is as follows:

Antimicrobial therapy and bed rest		
Minimal disease, Cases 1 and 3	71%	(12% added pnp.)
Mod. adv. disease, unilat., without cavitation		
Case 4, acute	61%	(28% added pnp.)
Case 5, fibrotic	43%	(51% would use collapse or resection —pnp. 23%, pnx. 12%, resection 16%)
Antimicrobial therapy and pneumoperitoneum		
Mod. adv. disease, acute, bilat., without cavitation		
Case 9	56%	(37% used drug therapy alone with bed rest)
Far adv. disease, bilat., with cavitation		
Cases 6, 7, 10	61%	(in case 7, resection 25%; in case 10, drug therapy alone with bed rest 35%)
Antimicrobial therapy and resection		
Mod. adv. disease, unilat., upper lobe 3 cm. cavity		
Case 8	52%	(thoracoplasty 11%; pnx. 18%)
Tuberculous pneumonia		(pnp. 25%; drug therapy alone with
Case 2	49%	bed rest 15%)

An earlier report concerned with this study conducted by this committee in 1948 has been translated into Japanese.

SUMMARY

A résumé and a 4 x 5 reduction of the chest roentgenogram of 10 cases of commonly seen types of pulmonary tuberculosis were sent to 100 chest physicians who were chosen by our committee as representative of the

top clinical thinking in their respective areas throughout the United States. Each consultant was asked to give his opinion as to treatment. A previous similar study was done in 1948, using the same 10 cases. In the present study the 1000 answers (10 each from 100 physicians) were analyzed and give a good cross-section of the current thinking on treating pulmonary tuberculosis.

Summary Tabulation

Type of Therapy	*Total* 1000 answers		*Minimal* Cases 1 and 3 (200 ans.)		*Mod. Adv.* Cases 4, 5, 8, 9 (400 ans.)		*Far Adv.* Cases 2, 6, 7, 10 (400 ans.)	
	No.	Per Cent	No.	Per Cent	No.	Per Cent	No.	Per Cent
Bed rest alone (possibly with drugs added later—4)	14	1.0	11	5.5	3	1.0	0	0
Intermittent combined drugs alone, plus bed rest (possibly with pnp. or pnx. later—38 possibly with surgery later—62)	372	37.0	143	71.5	151	38.0	78	19.5
Collapse therapy, plus drugs (10 without drugs) (possibly with surgery later—47)								
Pneumoperitoneum	347††	35.0	23	11.5	115	29.0	209	52.0
Pneumothorax	56	6.0	8	4.0	33	8.0	15	4.0
Phrenic	4	0.4	3	1.5	0†	0	1**	0.3
Extrapleural pnx., oleothorax, plombage	7	0.7	0	0	2	0.5	5	1.2
Total collapse	414	42.1	34	17.0	150	37.5	230	57.5
Surgery, plus drugs (2 without drugs)								
Excision	170	17.0	9	4.5	79	19.5	82	20.5
Thoracoplasty	29	2.9	3	1.5	16	4.0	10	2.5
Total surgery	199	19.9	12	6.0	95	23.5	92	23.0
Total	999*	100.0	200	100.0	399*	100.0	400	100.0

*On case 8 only 99 answers.
†6 added phrenic crush to pnp.
**17 added phrenic crush to pnp.
††33 additional men gave pnp. plus surgery and these 33 are carried under Surgery

RESUMEN

Un resumen y una reducción de radiografías de tórax entamaño 4 x 5, de 10 casos comunmente observados de los tipos de tuberculosis, se envió a 100 médicos especialistas del pecho, escogidos por nuestro comité como representativos del más elevado pensamiento clínico en las áreas respectivas en los Estados Unidos de Norteámérica. A cada consultante se pidió su opinión sobre el tratamiento. Un estudio preliminar semejante se hizo en 1948 usando los mismos 10 casos. En el estudio presente, las 1000 contestacio nes (10 por cada uno de los 100 médicos) se analizaron y dieron una buena información en corte del modo de pensar actual en el tratamiento de la tuberculosis.

RESUME

L'auteur a envoyé à cent spécialistes des poumons une observation résumée et des réductions radiographiques de dix cas de tuberculose pulmonaire banale. Ces cent médecins ont été choisis dans l'ensemble des Etats-Unis par le Comité, comme représentant les cliniciens les plus avertis de leur région. En utilisant les mêmes dix observations, une étude semblable avait été réalisée en 1948.

Dans l'étude qui est présentée aujourd'hui, les mille réponses (dix pour chacun des cent médecins) ont été étudiées et donnent une bonne vue d'ensemble de l'opinion générale concernant le traitement de la tuberculose pulmonaire.

ACKNOWLEDGMENTS

The authors wish to thank the 100 physicians whose participation made this analysis possible. Also to thank Mrs. Lucile Hughes for her technical assistance and Miss Ella Demuth for the photographic work.

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*Since this report has been prepared, the Committee on Non-Surgical Treatment has been enlarged.

Patency of the Ductus Arteriosus After Birth: A New Theory*

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The cause of patent ductus arteriosus has not yet been established. Spitzer[1] in his ontogenetic and phylogenetic explanation considers patent ductus arteriosus as a simple malformation due to an arrest of development. He was not aware that patency of the ductus can be accompanied by severe pulmonary hypertension (so-called reversed ductus)[2, 3, 4, 5, 6, 7] even though in most cases the pressures of the lesser circulation are normal or slightly elevated.[8, 9, 10] While his interpretation could be applied to the presence of isolated, uncomplicated ductus, there is no stage of normal development which corresponds to the conditions found in ductus with pulmonary hypertension.

Kennedy[11] in 1942 stated that "uncomplicated persistent patency of the ductus should not be regarded as malformation, but should be attributed to defective oxygenation of the blood during birth or shortly after." Several subsequent publications[12, 13, 14, 15] demonstrated fetal distress at birth and shortly after birth in a great number of the cases of patent ductus which were investigated. In statistical studies performed by Alzamora and co-workers,[15] the occurrence of patent ductus in children born above 9,000 feet is strikingly high. Experimental studies also give[16, 12] good evidence that asphyxia at birth may delay the closure of the ductus. Undoubtedly, as Record and McKeown[12] state: "these observations . . . do not dispose of the objection that closure might be expected to follow relief of embarrassment unless the possibility of closure is limited to a short period after birth." It has been shown that the ductus may be obliterated many months after birth, even in the presence of anoxia, like in cases of tetralogy of Fallot,[17] but this observation may not have direct bearing on the normal mechanism of closure. Spontaneous closure of the ductus has been described by several observers many months, and even years, after birth.[18, 19, 20]

While Record and McKeown state[12] that, in their cases, asphyxia at birth is related to the occurrence of patency of the ductus, they do not try to explain the sequence of events. It is not probable that patency of the ductus is the direct cause of cyanosis or asphyxia, as found right after birth, because patency, at least in the first few minutes of life, is physiological: blood flow is directed from left to right and there is no reason to suppose that, under otherwise normal conditions, this may cause embarrassment.

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One could speculate that circulatory embarrassment might be due to failure of the left ventricle. This chamber is suddenly called to carry the entire blood volume through the greater circulation when, right after birth, the placental blood stream is abruptly cut off and pulmonary respiration begins.

One fetal condition might leave the left heart unprepared for its task at the moment of birth: *premature closure of the foramen ovale.* Patency of the foramen ovale in fetal life and some time after birth is necessary for the proper development of the left side of the heart during fetal life and for a proper balance of pressures after birth, until the left ventricle is adjusted to its task.[13] The valve of the foramen ovale acts as an escape valve, and the blood flows from right to left in the fetal heart.

Brenner[21] and Lehman[22] pointed out that, if the foramen ovale closes prematurely, the following consequences may occur: overloading of the pulmonary circuit; increase of pressure in and increase of resistance of the pulmonary vessels; hypertrophy and dilatation of the right ventricle; atrophy of the left atrium; and decrease in size of the left ventricular chamber. During fetal life, with circulation maintained by the right ventricle—via ductus—oxygenation through the placenta is always adequate. After birth, the following sequence of events may occur: temporary or prolonged cyanosis caused by inadequate function of the left ventricle; slow adjustment of both ventricles to their new tasks; decrease of pressure in the pulmonary circuit; increase of pressure in the greater circulation. Abnormal conditions soon after birth may prevent closure of the ductus. They are anoxemia, high pressure in the pulmonary circulation, and hypertrophy of the walls of the ductus.

Patten[13] stressed the fact that congenital malformations may be caused by either acceleration or retardation of development. He also pointed out that premature closure of the foramen ovale can be explained by a too rapid growth of either the overlapping valve or of the secondary membrane. If we accept that patency of the ductus can be the consequence of an isolated malformation, e.g. the premature closure of the foramen ovale, the different clinical forms could be explained with the different fetal age at which this closure occurred.

There is as yet no direct experimental evidence demonstrating that premature closure or abnormal narrowing of the interatrial opening will cause patency of the ductus. However, autopsies of infants, who died a few hours after birth, revealed the existence of a thick-walled ductus and a definitely closed foramen ovale.[23, 24*] Recognition of premature closure of the foramen ovale at a necropsy effected later that the neonatal period is obviously a difficult task. Therefore, this theory will be purely speculative until experimental studies prove its truth.

*In a recently published article, Kreutzer et al[25] described the existence of closed foramen ovale in 3 cases of infants with a patent ductus arteriosus who died with left heart failure.

SUMMARY

The cause of patent ductus with different clinical manifestations and pathological findings—elevated or normal pulmonary pressures—can not be explained by Spitzer's theory of an arrest of development. Premature closure of the foramen ovale is the only isolated congenital malformation which could cause varying degrees of right ventricular hypertrophy, persistence of the fetal characteristics of the pulmonary vascular bed, and occasionally early left ventricular failure.

Two observations support this theory: (a) autopsy findings in infants only a few hours old, revealing a patent ductus with hypertrophied walls and a closed foramen ovale; (b) the knowledge that, except in complex congenital malformations, simultaneous patency of the ductus and of the foramen ovale is practically never found.

RESUMEN

La causa de persistencia del ductus arteriosus con diferentes manifestaciones clínicas- presiones pulmonares elevadas o normales-nopuede ser explicada por la teoría de Spitzer de una detención del desarrollo.

El cierre prematuro del foramen oval, es la única malformación congénita que porría causar variados grados de hipertrofia ventricular, persistencia de las características fetales del lecho vascular pulmonar y ocasionalmente insuficiencia vetricular izquierda temprana.

Dos observaciones soportan esta teoría: (a) hallazgos de autopsiacon sólo pocas horas de nacidos revelando un ductus abierto con paredes hipertrofiadas y un foramen oval clausurado. (b) el conocimiento de que, con excepción de las malformaciones congenitas complejas, prácticamente no encuentran jamas simultaneamente persistencia del ductus y del foramen oval.

RESUME

La cause de la persistance du canal artériel avec ses manifestations cliniques variées et ses conséquences pathologiques (pressions pulmonaires élevées ou normales) ne peut s'expliquer par la théorie d'un arrêt du développement qu'invoque Spitzer. La fermeture prématurée du trou de Botal est la malformation congénitale qui pourrait à elle seule entrainer une hypertrophie ventriculaire droite, avec ses degrés variés, la persistance des caractéristiques foetales du lit vasculaire pulmonaire, et éventuellement une insuffisance ventriculaire gauche précoce.

Deux observations vont à l'appui de cette théorie:

1) Des constatations d'autopsie chez les nouveauxnés, âgés de quelques heures seulement, où l'on a pu constater la présence du canal artériel avec des parois hypertrophiées et le trou de Botal fermé.

2) La notion qu'à l'exception de malformation congénitale complexe, on ne trouve jamais pratiquement associée la persistance du canal artériel et du trou de Botal.

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Regressive Giant Bullous Emphysema in Tuberculosis of Adults*

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In the last two years there have appeared several reports on large multiple bullae which develop in the parenchyma of one or both lungs, and tend to grow or to decrease and eventually disappear.

This type of cavity is seen in tuberculous patients under treatment by antibiotics and/or chemotherapy, particularly in those receiving isoniazid. The relationship between the latter drug and the development of such cavities is so close that most writers attribute the formation of the bullae to the isoniazid although they offer no satisfactory explanation for the mechanism of their production.

This phenomenon however should not specifically be due to isoniazid alone, since there are isolated reports of pseudocystic tuberculosis called pneumatocele in patients treated with streptomycin. Behamou, Levy Valensi and Mimouni (1947), Dufourt, Galy and Perrin (1950), Silverthone and Silverman (1950) and others cited by Dufourt[1] have recorded such cases. There is even another report by Pruvost and co-workers[2] who describe pseudocystic bilateral multiple cavities developing from an apical cavity but which did not regress. This case was not treated by antibiotics before the appearance of the pseudocysts.

Recently Caffey has published reports on the possibility of the appearance of cysts or cyst like cavities in infants in whom these congenital bullae underwent spontaneous regression.

Furthermore, it is already accepted that pseudocysts may develop after pulmonary abscesses and we have published a case of this occurrence although at that time did not realize that possibility.[3]

Staphylococcic infections may give rise to multiple cavities in the lungs and the possibility of multiple cavities following the course of miliary tuberculosis is also known.

However, development of multiple large cavities with a trend to rapid enlargement and subsequent regression and disappearance has not been reported until recently. We must admit that these reports coincide with the use of isoniazid in tuberculosis.

We have found 25 cases of bullae with the features mentioned recorded particularly in the European and South American literature. It is rather surprising that so distinctive a disease has not been more frequently reported in the United States.

The reports are those of Jacob and co-workers,[4, 5] Rossignol et al,[6] Etienne Bernard et al,[9] and Jacob, Cartier and Treps[5] in France; Pablo Purriel et al,[7] in Uruguay; Di Filipo in Italy[8] and Altman and Ornstein in the United States.[10]

*Presented at the 20th Annual Meeting, American College of Chest Physicians, San Francisco, California, June 17-20, 1954.

The main features of the peculiar disease described by these authors are:

I. It appears in patients with acute, severe, unilateral but most frequently bilateral tuberculosis of the upper lobes, with cavities and multiple foci of demonstrable disease.

II. All cases reported have received the isoniazid alone or associated with streptomycin and para-aminosalicylic acid.

III. They have had a favorable outcome with rapid improvement of general condition, weight gain, disappearance of toxic symptoms, bacteriological conversion and improvement of all laboratory findings.

IV. The roentgenological course has been characterized by a trend to clearance of exudative shadows and caseous deposits, while a variable number of thin-walled cavities becomes increasingly evident. These grow in volume and number, with the appearance of large cysts or cystic groups.

V. Further course of the disease shows a marked tendency of the bullae to decrease in number and size and eventually to disappear but those developed from preexistent cavities usually remain, although they have very thin walls and their aspect becomes more and more cyst-like.

VI. In the few cases where intracavitary pressure has been measured a definite patency of the bronchial channels is proved.

VII. The pleural space was found to be definitely occluded when resection was done or when intrapleural pneumothorax was attempted.

VIII. Lack of the usual pathology of cavities as well as the absence of epithelial lining has been demonstrated in resected specimens: the cavity walls consisted of thin connective tissue.

The case that we wish to present is interesting because it demonstrates objectively this new aspect of the disease and because it represents an extreme example of the regressive bullous lung in tuberculosis.

Case Report

N. S. G. male, 29, married, with irrelevant pathological and family history, suffered in the past only from dysentery. In June 1952, after some indefinite gastrointestinal symptoms, he had cough, emesis, yellowish expectoration and vesperal fever, for which he consulted a physician and had some non-specific treatment. As he did not improve he came to Mexico City where he saw another physician who diagnosed pulmonary tuberculosis of the left upper lobe. The first film at our disposal was

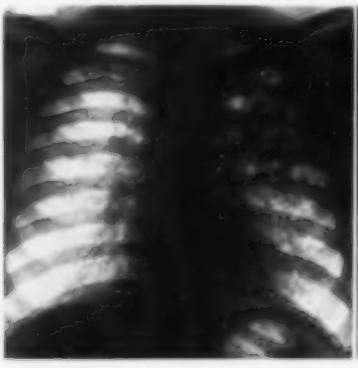

FIGURE 1

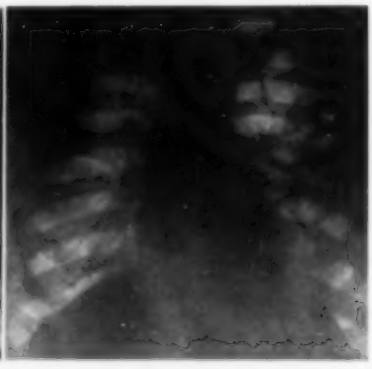

FIGURE 2

taken on Sept. 4, 1952 (Fig. 1). It is important to point out that the physician gave him a dose of subcutaneous Friedmann vaccine at that time. The patient claims that he obtained some relief but noticed no further improvement after four doses of the same vaccine. A second film was taken on Jan. 2, 1953 (Fig. 2).

Upon close interrogation the patient declared that he took about 300 tablets of 50 miligrs. of rimifon (Total 15 gms.).

Seen at the office on April 1, 1953, he was considered to be critically ill with bilateral tuberculosis. He had marked dyspnea, copious perspiration, slight cyanosis, a hacking cough, a pulse rate of 120 and upon auscultation, diminished breath sounds and a few scattered moist rales. A new film was taken (Fig. 3) in which multiple cavities are observed affecting both lungs with the single exception of the right lower lobe.

The patient was immediately sent to the Sanatorio San Angel, placed in semi-recumbent position, and given oxygen by nasal catheter. The first report from the laboratory gave the following findings: Sputum: six acid fast bacilli by concentration. Blood: Erythrocytes: 4.020.000, Leukocytes: 11.600, Hematocrit: 40 per cent, Sedimentation: Wintrobe: 50 mm., Lymphocytes: 20, Monocytes: 11, Segmented: 61, Stabs: 6, Myelocytes and other forms: 0, Eosinophiles: 2, Basophiles: 0, Urea: 28 mgrs., Glucose: 100 gmrs., and Chlorides: 480, Urine slight traces of albumin. Wassermann-Kahn negative.

On admission this patient was considered beyond recovery.

Pneumoperitoneum, administered in small volumes was well tolerated.

No change was observed immediately after this treatment. Besides, dihydrostreptomycin 1 grm., rimifon 300 gmrs., and PAS 12 gms., combined were given daily.

After 20 days he developed severe intestinal atony which required the use of prostigmine and a gastrointestinal tube. The intestines reacted favorably after several days. Pneumoperitoneum was stopped after these symptoms appeared.

On admission the temperature was irregular with a maximum of 39.5 C.

It fluctuated around 38.5 C. during the first month, but decreased thereafter while unexpected improvement was observed.

The first tomograms of April 4 1953, are presented in the three figures 4, 5 and 6.

In the series of 10 tomograms at that time 14 and 15 bullae could be counted on the right and left lungs respectively.

On May 21 the patient was seized with great dyspnea and cyanosis.

The respirations were 50 per minute, the pulse 155, fluoroscopy discovered spontaneous pneumothorax of the right lower lobe without collapse of the upper.

The presence of adhesions prevented complete collapse of the lower lobe and allowed breathing until a catheter could be inserted to aspirate the air. The pressure was plus 3; after aspiration it fell to 0 and returned to plus 3 without effort or cough.

The catheter was withdrawn after 10 days without relapse of the spontaneous pneumothorax.

Although bronchography, bronchoscopy, angiography, measurement of the intra-

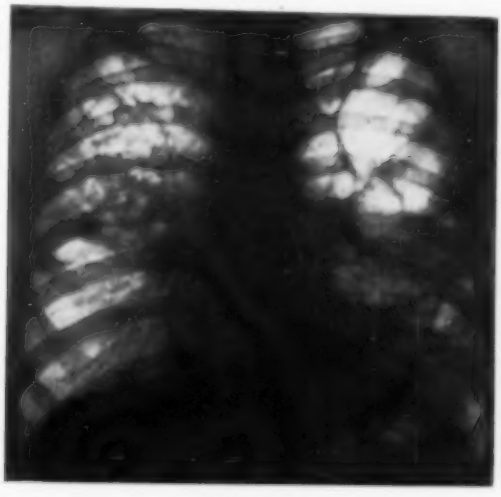

FIGURE 3

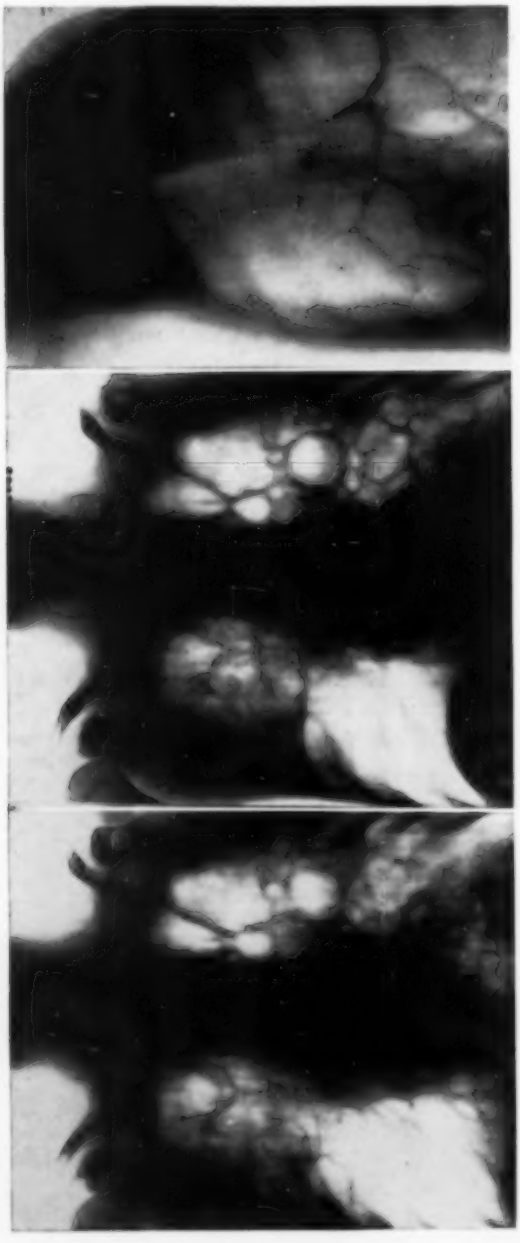

FIGURE 6

FIGURE 5

FIGURE 4

cavitary pressure, particularly on the left side where a large cavity seemed to be spontaneous pneumothorax were considered, the condition of the patient did not warrant any such procedures during the first weeks.

Slight improvement of bronchoscopy being done, showed merely a congestion of the mucosa and muco-purulent secretion, but the caliber of all bronchi was normal (Aug. 1953).

After further improvement a functional study was done with the following results:

Ventilation at rest	13.02 Lit./min.
Ventilation per Sq. Meter	8.6 Lit./min.
Max. volunt. ventilation	88.0 Lit./min.
Respiratory reserve V.M.V.	85 per cent Minimum Norm.: 92 per cent
Vital Capacity	1.300 c.c.
Brachial artery, rest	88 per cent (Norm saturation 86-92 per cent)
Brachial artery, exercise	80 per cent Saturation
Brachial artery with O_2	93 per cent Normal: 100 per cent

Cardiac Catheterization: Nov. 25, 1953:

Pulmonary pressure: 42/17 Normal: 30 Systolic.

Angiocardiography showed a good irrigation of the lungs with exception of the left upper lobe (Fig. 7). There is no doubt that the vascularization had much improved and that had an angiogram been done earlier, the results would have been different.

In July 1953 we thought that as in chronic emphysema a possible vascular factor was participating, therefore we gave a tablet of Priscol 3 times a day which later was substituted by 3 tablets (150 mgrs. a day) of beta-piridilcarbinol (Roniacol).

Tubercle bacilli were no longer found in the sputum after May 14, 1953 with only two exceptions (one bacillus per 50 and 20 fields respectively).* Cultures are still positive from some specimens. Treatment with dihydrostreptomycin was continued until the end of November 1953, but after July 1953 the regimen changed from 1 gm. daily to 1 gm. every two days. Roniacol was continued until the patient left the sanatorium in March 1954.

On dismissal only five cavities could be seen in the right and six in the left lung. The remaining bullae were smaller and a large one which at the beginning was taken for spontaneous pneumothorax, shrank and showed its wall. Also there were some round shadows suggesting small filled cavities (one at right and three at the left lung). Figs. 8, 9, 10, and 11.

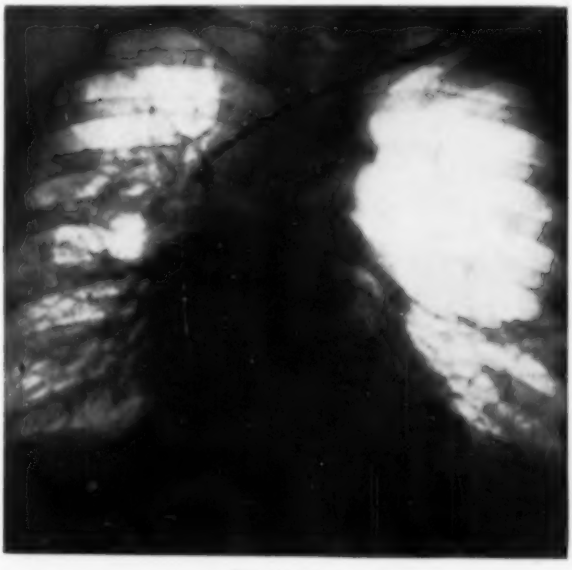

FIGURE 7

*According to another laboratory report the tubercle bacilli recovered in cultures were identified as of human type.

Further tomographic checks after two months showed only four well defined cavities on the right and two on the left.

The patient has no dyspnea; his temperature is normal, his respirations are 20; his pulse 80; his weight on admission was 46 Kgs. (101 Lbs.) it is now 62 Kgs. (136 Lbs.). The blood count is as follows: Erythrocytes: 5.470.000; Hemoglobin: 100 per cent; Leukocytes: 11.200; Lymphocytes: 16; Monocytes: 5; Segmented: 70; Stabs: 5; Juvs: 0; Myelo: 0; Eosinophiles: 4; Baso: 0; Sedimentation: 18; Hematocrit: 42.

It seems worth mentioning that during the whole regressive process treatment with dihydrostreptomycin, PAS and isoniazid was not interrupted.

Discussion

The case presented has the features of the group of cases presented by others. The mechanism of development of these bullous cavities is a matter of elaborate discussion and is far from cleared.

Some points are to be stressed: First: Although this is a new type of tuberculous disease which seems to appear under the influence of the new drugs it is rare, given the enormous number of patients so treated in the last years. In our personal experience with a great number of patients treated by streptomycin and a large and growing group treated with isoniazid we have not been able to find another case.

It is surprising that so few instances of this disease have been reported in the literature of the whole world.

In the American literature so far we have been able to find only the case published by Altman and Ornstein[19] who state that Auerbach has not found anything like this pathology in 2000 autopsies.

In the French literature we found 18 cases; six are described by Purriel in Uruguay and one by Di Filipo in Italy.

The rarity of this peculiar disease suggests that the circumstances under which it may develop are complex and exceptional and that they rarely coincide.

E. Bernard states that Steenken has produced bullous disease of the lungs in rabbits infected with tuberculosis and treated by isoniazid.

It is pertinent also to discuss whether these bullae must be considered as real tuberculous cavities in the commonly accepted sense; i. e., whether they are preexistent cavities, cleansed of their tuberculous content and

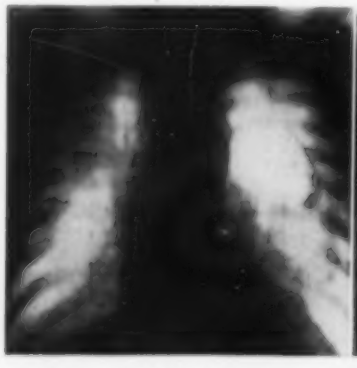

FIGURE 8

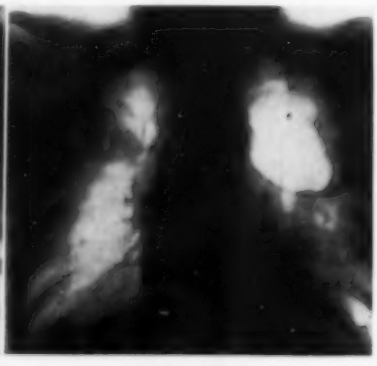

FIGURE 9

insufflated by the valvular mechanism already known.

This possibility has been accepted by E. Mayer and Bernou[11]; however it is open to discussion for the bullae appear not only in areas where cavities were previously observed but in those where no cavities or shadows were present.

The theory of preexistent cysts newly insufflated or even defective spaces (E. Mayer[11] and Caffey) cannot be upheld in view of the findings in the resected specimens in which no characteristic lining of preformed cavities or defects has been observed. These findings on the contrary demonstrate that the cavities are newly formed and are lined with connective tissue (Purriel and E. Bernard).

The assertion of Purriel that these spaces represent cleansed necroses the caseous content of which has been expelled through the bronchi (chemical casectomy), partly explains the mechanism but gives no satisfactory explanation for their insufflation for all authors agree that nearly all these cavities are open to the bronchial tree as far as we can tell from the pressure readings, bronchoscopies, and the study of the resected specimens.

We believe that an analysis of the possible factors involved in insufflation should lead us to a satisfactory answer. These are:

1. The bronchial factor. Stenosis, distortion of the bronchi, edema or bronchial occlusion.
2. Parenchymal destruction of lung tissue.
3. The vasculo-nutrient factor in the lung tissue.
4. Changes in innervation of the lungs.
5. Mechanical changes developing from structural alterations of the surrounding tissues, and particularly: *Changes in the pleurae.*

Contrary to the common finding in other tuberculous cavities the bronchial factor is practically absent and even in some cases where it has been claimed, it is not constant. Indeed, it seems to us that the condition develops when other premises concur precisely because bronchial access is open.

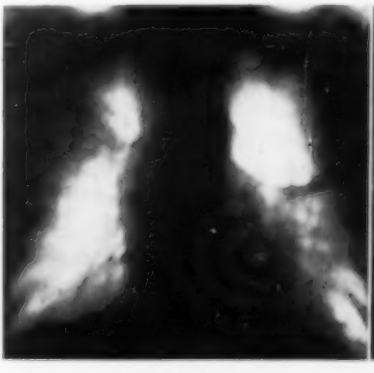

FIGURE 10

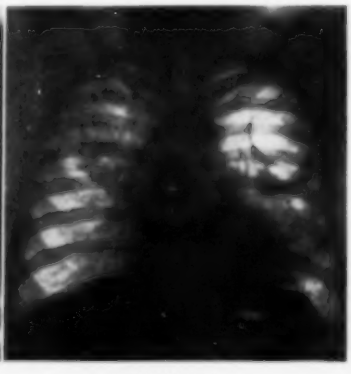

FIGURE 11

The destructive factor is real; all the cases described are severe, of destructive tendency and in most patients large cavities pre-exist. However new bullae develop in other sites where no lesions are observed.

We believe that lesions do exist but that they are minimal and easily escape detection. In our case when we re-examined the first films, we had to admit that some little points which usually are taken for vascular crossings could be spots where bullae developed later.

The vascular factor is worth discussion. The work of Ellis, Grindley and Edward[13] who were able experimentally to produce large cyst-like cavities in rabbits when the bronchial artery was ligated and the bronchus was obstructed at the same time is suggestive. The vascular component however explains the cyst formation only in part, for the obstructive bronchial component is lacking. On the other hand this explanation helps to clarify the mechanism of regression of the cavities for shunts between the lesser and the systemic circulation tend soon to establish themselves, the tissues in the lung do not long remain ischemic and therefore are able to recover functionally. In this regard the studies of Cudkowicz[14, 15] are most enlightening. They explain the possible mechanism of pulmonary ischemia in certain areas of tuberculous disease and hyperemia in others, leading at times to hemorrhage through the channels of the systemic circulation, at times to ischemic phenomena.

The other factor that we believe is most important when it is coincidental with others is the pathological change in the surrounding structures and most particularly in the pleurae.

In all cases reported the pleural space is absent or partly occluded as proved by attempts to induce pneumothorax or as found in resected specimens.

No other instance that we know, besides ours, has been reported of development of spontaneous pneumothorax. In our patient the spontaneous pneumothorax was small and faced the unaffected area of the right lower lobe, but the upper and middle did not collapse on account of adhesions. We were misled at the beginning because the left lung seemed to have a large spontaneous space which later was confirmed to be a large bulla (Fig. 8).

It is surprising that spontaneous pneumothorax does not occur more frequently in cases which are characterized by large blebs as it does in chronic emphysema (Rossignol[6]). The reports of bullae after the induction of intrapleural pneumothorax with a vanishing trend do not invalidate our opinion for they obey other mechanisms such as distortion of the bronchi.

It is our belief that fixation of the surrounding parenchyma to the chest wall by pleural adhesions is sufficient to bring about enlargement of the cavities or to create new ones by a traction effect added to real suction exerted by the cavitary defect. Enlargement of the cavity is favored by patency of the bronchi caused by the cleansing or detergent effect of the new antibiotics and chemotherapy. No other drug has the rapid de-

tergent effect of isoniazid on the caseous material. This also explains why in many cases of tuberculosis treated by this drug the shadows clear up while the cavities remain. The cavities under these circumstances enlarge by a mechanism opposite to the commonly accepted one of the bronchial check valve.

The passive mechanism of suction without check valve action explains the negative or neutral pressures measured in these large bullae.

The cavity should expand during inspiratory expansion of the chest and the air may flow out freely during expiration, but the space will not deflate.

The innervation of the lung may also act as a contributory factor.

It is possible that the already known sympatho-tonic constriction of the lumen of the bronchial arteries caused by isoniazid could act like the ligature of the vessels as observed by Ellis and his co-workers.

Those who thought that the bullae were due to the use of isoniazid discontinued its use. The cavities regressed thereafter; yet it is important to note that *although we did not discontinue the use of isoniazid*, nor SM and PAS in our patient, nevertheless we observed regression of the cavities.

We administered vasodilators such as Priscol and beta-piridilcarbinol as we do in our treatment of chronic emphysema with the result described. The explanation for the regressive tendency without the interruption of isoniazid may be found in the phenomenon of fatigue of the vasculo-nervous response to the drug or in the restitution of the tissue circulation through newly formed shunts between the systemic and the lesser circulation. The contribution of vasodilators to this is a matter which requires further discussion and research.

It is because circumstances for the development of bullae rarely assemble or coincide, that the phenomenon is rare.

The addition of the detergent action of the new drugs is the most important feature which helps but is insufficient by itself to create this infrequent complex.

Summarizing our discussion, the factors which concur in the development of these large parenchymal bullae within the lung tissues are:

1. More or less extensive destruction of alveolar tissue, with cleansing and expulsion of caseous material.
2. Absence of bronchial obstruction.
3. Constriction of the vessels through nervous interference.
4. Expansion of the cavities by suction partly due to fixation of the lung to the chest wall and lack of the lobar sliding of the unaffected tissues which otherwise could fill the space.
5. Regression of the bullae provided by the integrity of the parenchymal tissue and restitution of the nutrient bronchial and parenchymal vessels.

The pulmonary tissues initially undamaged would remain airless and ischemic acting as a reserve which may expand when further favorable vascularization occurs.

It has been suggested that similar instances of bulla formation will

be encountered more frequently. We also believe that their frequency will increase; at the same time we believe that their development can be avoided if their mechanical causes are prevented by adequate means which may avoid the distending factors, such as pneumoperitoneum and the graded application of detergent drugs, beginning with streptomycin and PAS prior to the use of isoniazid when indicated in multicavitary lesions with confluent shadows under which necrosis may lie hidden. The use of vasodilators to counteract the possible action of ischemic drugs may be warranted if the hypothesis of a vasoconstrictive factor seems plausible.

Finally in the particular case presented we believe that to the above named factors another could be added; viz: A possible multiple focal reaction provoked by the use of vaccine of living bacilli (Friedmann Vaccine). This might cause a multiple Koch like phenomenon with numerous necrotic foci ending as in staphylococemia and miliary tuberculosis in the production of cystic bullae.

SUMMARY

In the last two years several reports have been published on large multiple bullae developing within the parenchyma of the lung with tendency to grow or to decrease and eventually to disappear.

This type of lesions is seen in tuberculous patients treated with antibiotics and particularly in those treated with isoniazid.

The number of cases reported is not large, the author has been able to find only 25 cases in the European and South American literature and only one in the United States.

The main features of this peculiar type of tuberculous disease are described and a new case is presented with tomograms, angiograms, roentgenograms, etc. illustrating an extreme example of multiple cyst like cavities which during the course of the disease increased to 14 bullae in the right and 15 in the left lung which later regressed to four in the right and two in the left.

The mechanism of this condition is discussed at length and an hypothesis of its development is presented.

According to the author these cavities could develop under conditions which rarely assemble: Destruction of lung tissue large or small but multiple. Changes in the innervation and vasculo-nutrient factors in the lung, and particularly adhesion of both pleurae bringing about a mechanism of suction toward the defect favored by the patency of the bronchi already cleansed and patent, under the action of the antibiotics and especially under the influence of isoniazid.

The regressive trend is explained by the restoration of the blood supply through newly formed vessels or shunts between the lesser and the systemic circulation favored by the phenomenon of fatigue of the constrictive action of the drugs on the bronchial vessels.

In the case presented another rare factor is considered: the use of a vaccine of living bacilli (Friedmann's) could produce a multiple Koch

phenomenon which caused numerous defects later filled by the described mechanism of suction.

RESUMEN

En los últimos dos años han aparecido publicaciones sobre múltiples bulas en el parénquima pulmonar que se han desarrollado en enfermos de tuberculosis. Estas bullas tienen tendencia a crecer en tamaño y en número y después a decrecer y aún a desaparecer.

Esta forma de la enfermedad tuberculosa se observa en pacientes tratados con antibióticos y especialmente, cuando se usa la isoniacida. No sería estrictamente específica puesto que se han relatado casos raros en enfermos tratados con estreptomicina y aún en casos no tratados con antibióticos. Pero sería aún más rara puesto que los casos descritos han sido más numerosos desde que se usa la isoniacida, que antes de ella, aunque no dejan de ser raros.

El número de casos publicados no es grande pues el autor sólo ha podido reunir hasta ahora 25 casos publicados en Europa y en Sudamérica y sólo hay uno publicado en los Estados Unidos.

Se describen las características de esta nueva forma de la enfermedad tuberculosa y se presenta un caso nuevo con estudios tomográficos, angiográficos, roentgenográficos, etc. que ilustran un ejemplo extremo de esta condición que en el curso de su observación llegó a mostrar 15 bulas en el lado derecho y 16 an el izquierdo, para disminuir a sólo 4 en el derecho y 2 en el izquierdo.

Se discute extensamente el mecanismo de la aparición de estas bulas y se presenta una hipótesis de su desarrollo.

De acuerdo con las ideas del autor estas bulas múltiples se formarían cuando se reunen condiciones numerosas que rara vez coinciden.

Esas condiciones serían: destrucción de parénquima grande o pequeña pero múltiple, cambios en la inervación y en la vascularización nutricia del pulmón y especialmente adherencia extensa de las pleuras lo que traería un complejo mecanismo de succión hacia la pérdida de parénquima y entrada de aire favorecida por la limpieza de la luz bronquial que sería determinada por la acción de los antibióticos y en especial de la isoniacida.

La tendencia regresiva sería explicada por la restauración de la circulación nutricia por vasos neoformados por intercomunicación entre la circulación mayor y la menor y por el fenómeno de fatiga frente a la acción prolongada de drogas con posible acción constrictiva vascular.

En el caso que se presenta se agrega otro factor raro: El uso de la vacuna de Friedmann, que tiene bacilos vivos, pudo haber producido un fenómeno de Koch múltiple que condujo a numerosas pérdidas de parénquima que después se llenaron por el mecanismo de succión descrito.

RESUME

Au cours de ces deux dernières années, plusieurs publications ont été consacrées à la formation de bulles dans le parenchyme pulmonaire des malades atteints de tuberculose. Ces bulles peuvent augmenter en dimen-

sion et en nombre, puis diminuer et même disparaitre.

Cet aspect de la tuberculose pulmonaire s'observe chez les malades traités par antibiotiques et plus particulièrement par l'isoniazide. Toutefois, il n'y a pas une exclusivité pour ce dernier produit puisque quelques rares cas ont été rapportés chez des malades traités uniquement par la streptomycine, et même chez des malades qui n'avaient reçu aucun traitement antibiotique ou chimiothérapique. C'est depuis l'usage de l'isoniazide en tout cas que ces lésions semblent surtout être connues.

Le nombre d'observations publiées n'est pas élevé, et l'auteur n'en a pu réunir jusqu'à ce jour que 25 en Europe, et en Amérique du Sud, et une seule au Etats-Unis.

L'auteur expose les caractéristiques de cette nouvelle modalité de la maladie tuberculeuse et en présente une nouvelle observation étudiée au point de vue tomographique, angiographique, radiologique, etc. . . . Son cas représente un type extrême de l'affection, puisqu'il se constitua jusqu'à 15 bulles du côté droit, et 16 du côte gauche, qui finalement se réduisirent à 4 à droite, à deux à gauche.

L'auteur discute le mécanisme de l'apparition de ces bulles et en propose une explication. D'après lui, ces multiples bulles se constitueraient quand se trouveraient réunies une série de conditions que en pratique, coïncident rarement.

Ces conditions seraient : l'existence de zones destructives du parenchyme, de petite ou de grande étendue, mais multiples ; certaines modifications de l'innervation et de la vascularisation nourricière du poumon ; et plus spécialement des adhérences pleurales qui seraient à l'origine d'un mécanisme complexe de succion et d'entrée d'air, favorisé par l'action des antibiotiques et surtout par la propreté de la lumière bronchique produite par l'isoniazide. La tendance régressive s'expliquerait par la restauration de la vascularisation nourricière à l'aide des vaisseaux néoformés par intercommunication entre grande et petite circulation, et par la fenomene de fatigue due à l'action prolongées des drogues, qui ontprovoqué constriction vasculaire.

Dans l'observation rapportée, s'ajoute un autre facteur rare, c'est l'emploi du vaccin du Friedmann, celui-ci contenant des bacilles vivants, qui ont pu produire un phénomène de Koch, occasionnant de nombreuses destructions parenchymateuses, qui ont été ultérieurement comblées par le mécanisme de succion décrit.

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Experience with Pyrazinamide

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Introduction

Pyrazinamide, a nicotinic acid derivative, is related chemically to Isonicotinic Acid Hydrazide as can be seen from the following formulae:

Pyrazinamide
Trade Name of
Lederle Laboratories "Aldinamide"
Merck and Company, Inc., "MK 56"

Isonicotinic Acid Hydrazide
Trade Name of
E. R. Squibb and Son "Nydrazid"
Hoffmann LaRoche Inc., "Rimifon"

While numerous clinical investigations have been reported of isonicotinic acid hydrazide and its isopropyl derivative (marsilid), those pertaining to pyrazinamide have been fewer but fundamental.[1, 2, 3] Furthermore, the published clinical effects of this antimicrobial agent were fortified by animal experiments by Malone[4] and Dessau[5, 6] and their associates. More recently, McDermott and his associates[7] in a very thorough experimental and clinical study of pyrazinamide combined with isoniazid have, in our opinion, rightfully warned against its use despite the fact that their results point to a greater potency for this drug than for any of the existing antituberculous drugs. This warning stems from the frequently observed hepatitis accompanying its use; an observation which is verified by our own experience. It is mainly this reason, coupled with the frequency of fatal hemoptyses encountered that prompts us to render this report even

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though in most other respects our observations do not differ materially from those reported by the aforementioned workers.

Plan of Investigation

Our investigation began March 22, 1952 and was completed February 6, 1953. We used MK 56 which was supplied by Merck & Company, Inc. and is identical chemically with pyrazinamide. The original purpose of our study was to ascertain the effectiveness of the drug in refractive cases of tuberculosis. We therefore selected patients who had had ample bed rest therapy and all, except four, one or more courses of streptomycin and para-aminosalicylic acid (PAS) and who failed to respond favorably. In all instances, however, there was demonstrated roentgenographically a component of the disease which was considered reversible and served as a baseline for the evaluation of the efficacy of pyrazinamide.

Before the investigation, each patient had a chest roentgenogram, urine analysis, complete blood count, blood chemistry and sputum smears and/or cultures. After consultation with the pathologist, it was agreed that the only liver function test would be the cephalin flocculation. All of the above studies were repeated bi-monthly during treatment.

Three grams of MK 56 divided into four equal doses was used and one gram of streptomycin twice weekly or 8 to 12 grams of PAS when these were added.

Results

Using the criterion of roentgenographic evidence of retrogression, we have divided the 60 cases comprising this report into two groups, 47 who showed either no change or progression of the tuberculous process and 13 in whom unquestionable improvement took place. There was no essential difference in sex, age, race and stage of disease in the two groups (Table I).

TABLE I: SEX, RACE, AGE AND STAGE OF DISEASE

Group	Sex	No.	Race	No.	Age Range	Stage of Disease	No. of Cases
I	Male	33	White	41	From 12 to 73 years	Minimal	0
					Average 45.1 years	Moderately Advanced	6
Unimproved	Female	14	Colored	6		Far Advanced	41
Group	Male	11	White	11	From 28 to 62 years	Minimal	1
II						Moderately Advanced	2
	Female	2	Colored	2	Average 44.2 years	Far Advanced	10
Improved							

The duration of tuberculosis (Table II) in the 11 of the 13 patients in group two who received either MK 56 alone or in combination with

TABLE II: DURATION OF DISEASE[1] AND PREVIOUS ANTIMICROBIAL THERAPY[2]

	Drug	Duration of Disease Range and Average	No. of Cases	Range and Average Streptomycin Dosage	No. of Cases
Group I Unimproved	MK 56	1-45 mos. 14.1 mos.	22	30-298 gms. 134 gms.	22
	MK 56 + Streptomycin	1-48 mos. 16.1 mos.	21	56-186 gms. 111.3 gms.	21
	MK 56 + PAS.	10-25 mos. 16.8 mos.	4	60-286 gms. 151 gms.	4
Group II Improved	MK 56	0-7 mos. 2.3 mos.	5	1-120 gms. 61 gms.	5
	MK 56 + Streptomycin	3-12 mos. 4 mos.	6	0-151 gms. 82 gms.	6
	MK 56 + PAS.	9-24 mos. 16.5 mos.	2	128-161 gms. 114.5 gms.	2

[1]From onset of disease for new patients, or from time of reactivation for readmissions.
[2]Streptomycin was given with PAS.

streptomycin was apparently shorter than in group one. This was a chance finding, for the cases were not deliberately so selected. Whether the shorter duration contributed to the favorable results will be considered later. Again referring to table two, one should note that the patients in both groups are further divided into those who received MK 56 alone and those who were treated with the latter combined either with streptomycin or PAS. It should be stressed at this juncture that only seven of the 22 in group one and two of the six in group two were given MK 56 and streptomycin simultaneously at the beginning of treatment; in the remaining patients streptomycin was added after a preliminary interval averaging 3.6 months during which MK 56 alone was prescribed. The total dosage of MK 56 and duration of treatment are shown in Table V.

TABLE V: SHOWING VARIATION AND AVERAGE DOSAGE (IN GRAMS) AND DURATION OF TREATMENT (IN MONTHS) OF MK 56

	Drug	Dosage Range	Dosage Average	Duration Range	Duration Average	Number of Cases
Group I Unimproved	MK 56	126-942	389	1.5-10	4	22
	MK 56 + Streptomycin	81-903	510	1-10	5.6	21
	MK 56 + PAS	336-474	404	3.6-5.3	4.5	4
Group II Improved	MK 56	285-729	515	3-8	5.4	5
	MK 56 + Streptomycin	354-653	520	4-7	6	6
	MK 56 + PAS	430-555	492.5	5-6	5.5	2

We do not hold that conversion of sputum in the presence of cavitation is significant. In the first place, if repeated careful cultures or animal studies of bronchial secretions are performed, bacilli are likely to be

found even when they are absent in a few specimens. Moreover, observations indicate that the sputum becomes bacillary once again at varying intervals after antimicrobial therapy is discontinued. Nevertheless for those interested, conversion of sputum occurred in 11 of the total number treated; four of these were contributed by the improved group.

Of the 13 who responded favorably, three had cavitation in addition to the infiltrative disease which was present in all. In not a single instance was cavitary closure affected although the cavity of one patient shrank to one third its original size and then began to enlarge after resistance to the pyrazinamide appeared. Progressive resolution of the infiltrations was observed in all in this group, only small residuae remaining at the completion of treatment.

Symptomatic improvement occurred in both groups although quantitatively there was an appreciable difference between them and a parallel difference in each group between those who received MK 56 alone and those on combined treatment of MK 56 and streptomycin. The number of patients who were on the combination of MK 56 and PAS was too small to be statistically significant (Tables III and IV).

TABLE III: WEIGHT CHANGE

	Drug	Gained Weight		Unchanged	Lost Weight	
		No. of Patients	Pounds	No. of Cases	No. of Cases	Pounds
Group I Unimproved	MK 56	7	2-9	8	7	2-15
	MK 56 + Streptomycin	14	3-35	6	1	5
	MK 56 + PAS.	2	3-8	2	0	0
Group II Improved	MK 56	4	6-35	1	0	0
	MK 56 + Streptomycin	6	14-35	0	0	0
	MK 56 + PAS.	2	7-11	0	0	0

TABLE IV: OTHER SYMPTOMS

		Cough			Expectoration			Appetite		
	Drug	Decreased	Unchanged	Increased	Decreased	Unchanged	Increased	Increased	Unchanged	Decreased
Group I Unimproved	MK 56	8	11	3	9	13	0	5	13	4
	MK 56 + Streptomycin	14	7	0	14	6	1	10	11	0
	MK 56 + PAS	3	1	0	3	1	0	2	1	1
Group II Improved	MK 56	2	3	0	2	3	0	2	3	0
	MK 56 + Streptomycin	3	3	0	3	3	0	2	4	0
	MK 56 + PAS	2	0	0	2	0	0	2	0	0

TABLE VI: TOXICITY

Toxicity	No. of Patients	Mortality
Hepatitis with Jaundice	8	1
Hemoptysis	8	7
Nausea	11	0
Abdominal Pain	4	0
Skin Rash	3	0

Drug Toxicity

The toxic effects are shown in Table VI and are disturbing in that a high incidence of hepatitis and fatal hemoptyses was encountered. Liver damage as judged by jaundice developed from one to six months after therapy (average 3.9 mos.) in eight patients, one of whom expired one week after jaundice appeared. Autopsy revealed characteristic findings of chemical hepatitis. In the remaining patients the jaundice was transient and disappeared after the drug was discontinued. Interestingly enough in only two of the patients was the cephalin flocculation test positive when jaundice was noticed. However, if disturbance of liver function is considered and measured by the cephalin flocculation test, there was a total of 19 in whom the test became positive after two to five months of treatment (average 2.5 mos.) and remained positive in all but three instances.

While we have no explanation to offer for the unusual number of fatal hemoptyses we are impressed with the fact that it exceeds in incidence manyfold all previous observations in this regard in patients with far advanced tuberculosis treated without or with other antimicrobial agents. Jaundice was present in one, the cephalin flocculation was positive in three of the seven cases of fatal hemoptyses at the time of death. Yet we cannot dismiss from our minds that a causal relation should be entertained.

Discussion

Our experience indicates a much lower incidence of roentgenographic retrogression of disease than in the series originally reported by Yaeger. It should be recalled however, that the number of far advanced cases in his report constituted 62 per cent as against 85 per cent in ours. But we do not believe that roentgenographic improvement depends entirely on extent of disease, for of the 13 cases in this study who responded favorably (Table II) the average duration of tuberculosis in 11 was materially less than in the 43 in the same categories who were not affected by the drug. We believe it is generally recognized that reversibility of disease is more likely to occur the shorter its duration. It is therefore difficult to reconcile conflicting reports based on extent of tuberculosis.

In this connection, it is of interest to analyze in more detail the patients who received MK 56 and streptomycin. Of the 21 in whom roentgenographic resolution did not take place (Group 1—Table II), the aver-

age total dose of streptomycin prior to treatment with MK 56 was 111.3 grams and the duration 16.8 months, those in Group 2 who did demonstrate roentgenographic improvement, the average total dose was 82 grams and the duration four months.

Furthermore, correlating these observations with drug sensitivity, it was noted that of seven available reports among the patients who had received the larger doses of streptomycin, six revealed resistant bacilli.

On the other hand, those to whom the smaller doses were administered, three out of six were sensitive to streptomycin. We believe this suggests that the combination of MK 56 and streptomycin is more effective. We have already pointed out that symptomatic improvement is more striking on combined therapy even in the absence of roentgenographic retrogression—this despite the fact that 75 per cent of the patients in whom sensitivity tests were obtained were resistant to streptomycin.

Unfortunately, serial bacteriologic studies for evaluating rapidity of development of resistance to MK 56 were obtainable in only 11 patients. In these the resistance emerged from two to 13 weeks (average 7.3 weeks). This tends to confirm the general impression that resistant strains of tubercle bacilli emerge rather early with pyrazinamide.

The surprising finding and one which, in our opinion, prohibits—at least for the present—the use of this antimicrobial agent alone or in combination with other antituberculous drugs, is its toxicity. We say surprising because Yeager[1] originally and more recently Campagna and his associates[8] seem to minimize this. Moreover, since in only two of the eight who presented jaundice, prior disturbance of hepatic function was elicited as measured by cephalin flocculation test, we cannot see how one can prejudge when to discontinue the drug to prevent hepatitis. The total dosage and period of administration as a guide in this respect are also unpredictable since fatal hepatitis developed as early as after one month of treatment during which 90 grams of MK 56 were administered and as late as six months with 561 grams of the drug.

SUMMARY

1. Sixty cases were treated with pyrazinamide; 27 with this drug alone and the remainder in combination with streptomycin or PAS.

2. Retrogressive roentgenographic changes were observed in 13 (21.6 per cent). Symptomatic improvement, however, was more frequent and more marked.

3. Roentgenographic improvement appears to depend more on the duration of the disease than on its extent and is more prevalent when pyrazinamide and streptomycin are used together.

4. Toxic effects consist of hepatitis and fatal hemoptyses. Of the former there were eight patients with one death and of the latter eight patients, seven died.

5. In view of the prevalent toxicity of the drug we believe that its use should be discouraged.

6. Conversion of sputum took place in 11 (18.3 per cent).

RESUMEN

1. Se trataron 60 casos con pirazinamida; 27 con la droga sola y las siguientes en combinación con estreptomicina y PAS.

2. Se observaron cambios regresivos en 13 enfermos (21 por ciento). Mejoría sintomatica fué mas notable sin embargo conmayor frecuencia y fué mas acentuada.

3. La mejoría radiológica parece depender más de la duración de la enfermedad que de su extensión y es más frecuente-cuando se usan la pirazinamida asociada a la estreptomicina que cuando se usa sola.

4. Los efectos tóxicos consisten en hepatitis y hemptisis fatal. De la primera hubo ocho enfermos con una muerte y de la-otra, ocho enfermos con siete defunciones.

5. En vista de la prevaleciente toxicidad de la droga creemos que su uso debe desalentarse.

6. La conversión del esputo tuvo lugar en 11 (18.3 por ciento).

RESUME

1. Soixante cas ont été traités par la pyrazinamide; 27 par ce produit à tire isolé, et les autres en combinaison avec la streptomycine ou le P.A.S.

2. Chez 13 malades (21%) une régression des signes radiologiques fut observée. Mais l'amélioration des symptômes fut plus fréquente et plus manifeste.

3. Les améliorations radiologiques sont plutôt en rapport avec le fait qu'il s'agit de maladie plus ou moins récente qu'avec l'étendue des lésions. Elles sont plus évidentes lorsque la pyrazinamide est associée à la streptomycine.

4. La toxicité du produit put être cause d'hépatites ou d'hémoptysies mortelles. L'hépatite frappa huit malades et détermina un décès; il y eut huit cas d'hémoptysies avec sept morts.

5. Etant donné l'action toxique de ce produit, les auteurs pensent qu'il n'y a pas lieu d'encourager son utilisation.

6. La disparition des bacilles de l'expectoration survint dans onze cas (18,3%).

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Experiences in the Management of Long-Standing Chronic Cases of Pulmonary Tuberculosis Treated with Isoniazid for One Year[1, 2]

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Introduction

This investigation was conducted at Dunham Hospital, Cincinnati, Ohio, beginning May 15, 1952. The problem considered was the institutional management of the "maximum benefit" or "good chronic" case of pulmonary tuberculosis. This group included individuals with extensive pulmonary tuberculosis of many years' duration. In most cases the disease was bilateral with cavitation, and in all cases tubercle bacilli were present in the sputum either constantly or intermittently. Practically all of these patients had had prolonged bed rest, streptomycin and para-aminosalicylic acid, collapse therapy with and without surgery. It was felt that maximum benefit from hospitalization had been achieved, but discharge could not be considered in keeping with public health policies.

At this institution patients in this category of "good chronic" cases are housed in a separate building, a former preventorium. All patients are completely ambulated, in that they attend meals in their own cafeteria and have full ward privileges. We believe this type of arrangement affords the most suitable care for the fully ambulatory "good chronic" case, and it frees a hospital bed for the treatment of the more acute case.

Selection of Patients

For this study 38 patients in the category of "good chronic" cases were chosen at random. The study was begun on May 15, 1952, when isoniazid first became available. All patients were adult white males, and all had disease classified as far advanced. For the most part the group was made up of individuals in the older age bracket. The median age was 53 years. The youngest individual was 19 years of age and the oldest was 76. Fourteen were over 60 years old.

Twenty-one had more than one previous admission to this hospital. Two had been admitted here five times. (Many of this type frequently leave the hospital against medical advice).

Most of the individuals in this study group had histories of long hos-

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2. The isoniazid (Tyvid) in this study was furnished by the William S. Merrell Co., Cincinnati, Ohio.

pitalization prior to institution of this regimen of therapy, with the average length of hospitalization prior to this study being 37 months.

As to previous therapy, 24 of the original 38 patients had previous courses of streptomycin in combination with para-aminosalicylic acid. Many of the courses were quite intensive and prolonged. One had received 323 grams of streptomycin along with para-aminosalicylic acid. Another had received 241 grams of streptomycin and para-aminosalicylic acid.

Plan of Study

The regimen decided upon was isoniazid, 250 milligrams daily, given orally in two doses. In March, 1953, the dosage was changed to 300 milligrams daily, given in three doses, this change being made merely as a matter of convenience, as the medication was then being supplied in 100 milligram tablets in place of the 50 milligram tablets.

The group selected were to have an evaluation of subjective symptoms made once each month. Weight was to be recorded each week. Sputum studies were to be made each month, and roentgenologic comparisons made every three months.

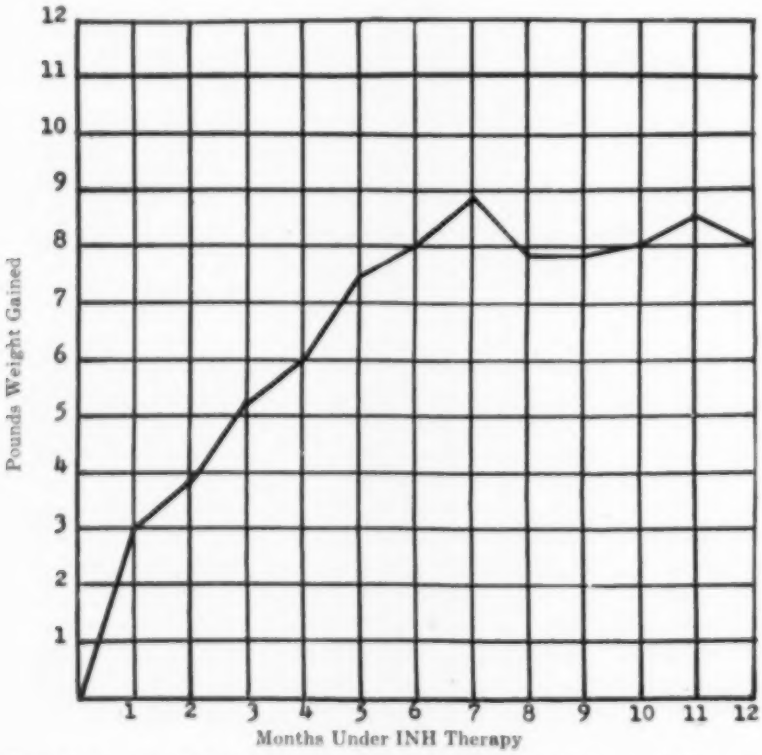

FIGURE 1: Average Weight Gain per Month of Patients on Isoniazid Therapy.

Observations or Results

Gain in Weight:

The early clinical response was remarkable. Improvement in appetite was noted almost at once. At the end of one month, 26 reported improved appetites. Several developed voracious appetites. One individual gained 11 pounds the first month. Thirty-three showed a weight gain the first month. (See Fig. 1). Weight gain continued throughout the entire year. At the end of one year only seven of the original 38 failed to show an increase in weight. One was 30 pounds heavier at the end of the year,

TABLE I: Showing progress of patients at three-month intervals while undergoing isoniazid therapy.

	(8-15-52) 3 Months	(11-15-52) 6 Months	(2-15-53) 9 Months	(5-15-53) 1 Year
PATIENTS:				
Discharged as arrested	0	0	3	3
Discharged against medical advice	3	1	0	0
Died	1	0	1	0
Remaining	34	33	29	26
APPETITE:				
Improved	26	25	21	17
Unchanged	8	8	7	6
Worse	0	0	1	3
COUGH:				
Improved	30	30	21	20
Unchanged	4	3	3	3
Worse	0	0	5	3
SPUTUM VOLUME				
Decreased	30	29	21	20
Unchanged	4	4	3	3
Increased	0	0	5	3
CHEST X-RAY				
Improved	10	16	16	18
Unchanged	22	15	11	6
Worse	2	2	2	2

TABLE II: Comparison of Cough Medications Consumed During the Months of March, 1952, and September, 1952.

	March, 1952 (Census—47 Patients)	September, 1952 (Census—64 Patients)
Codein Sulphate	333 grains	270 grains
Dromoran	14 grains	0 grains
Hycodan	30 grains	15 grains
	377 grains	285 grains
Elixir Terpin Hydrate with codeine	88 fl. oz.	40 fl. oz.
Elixir Terpin Hydrate plain	64 fl. oz.	8 fl. oz.
Linctus Codeine	None	24 fl. oz.
Syrup of White Pine	24 fl. oz.	24 fl. oz.
Brown's Mixture with Amonium Chloride	16 fl. oz.	None
Total	192 fl. oz.	96 fl. oz.

and four others had gained more than 15 pounds each at the end of the study.

Cough and Volume of Sputum:

Decrease in cough and sputum volume reduction were also striking. At the end of one month of therapy, 24 reported cough much improved and sputum volume much decreased. One individual reported his sputum volume reduced from 12 ounces a day to less than ¼ ounce after two months of therapy. At the end of three months of therapy, 30 patients reported their cough and sputum volume much improved. (See Table I).

A marked reduction in consumption of cough medication was noted fairly early in the study. (See Table II). A comparison was made of the amount of narcotics and plain cough syrup used during the month of March, 1952 (before isoniazid therapy) to that used during the month of September, 1952 (after four months of isoniazid therapy). These data were compiled from requisition slips, entirely in retrospect, since there had been no conscious effort on the part of the medical or nursing staff to limit the use of cough medication. In evaluating Table II, it should be noted that this comparison was drawn on the ward as a whole and included many individuals not receiving isoniazid; also that in March, 1952, the census on the ward was 47, while in September the average census was 64 patients, an increase in patient load of almost 50 per cent. We believe the marked reduction was entirely spontaneous on the part of the patients receiving isoniazid, in that, as indicated previously, their cough was much relieved by the drug.

X-Ray Shadow Progress:

For the most part, chest x-ray shadow improvement lagged behind clinical improvement. At the end of three months 10 showed demonstrable improvement, but most of this was very slight. At the end of six months no dramatic x-ray shadow improvement was evident; however, 16 showed some improvement. By the end of nine months, six had made substantial x-ray shadow improvement. At the end of nine months three had shown sufficient x-ray shadow and clinical improvement to be discharged as arrested, and at the end of one year three more were discharged as arrested, with contraction of fibrotic lesions and cavity closure. Only two showed progression of disease on x-ray films during this study.

Reduction in Positive Sputum:

During the study some relapses did occur, in that patients whose sputum had converted to negative reverted to positive. Only seven converted to negative sputa and remained negative for the entire year. Others became intermittently negative, and as indicated in figure 2, the incidence of positive sputa was considerably decreased at any given time during the year of study. During any one month less than 50 per cent had positive sputum.

As shown in Table I, at the end of nine months of therapy, five in whom there was no change or improvement in the early months of treatment, now felt that their cough and sputum volume were worse. At the end

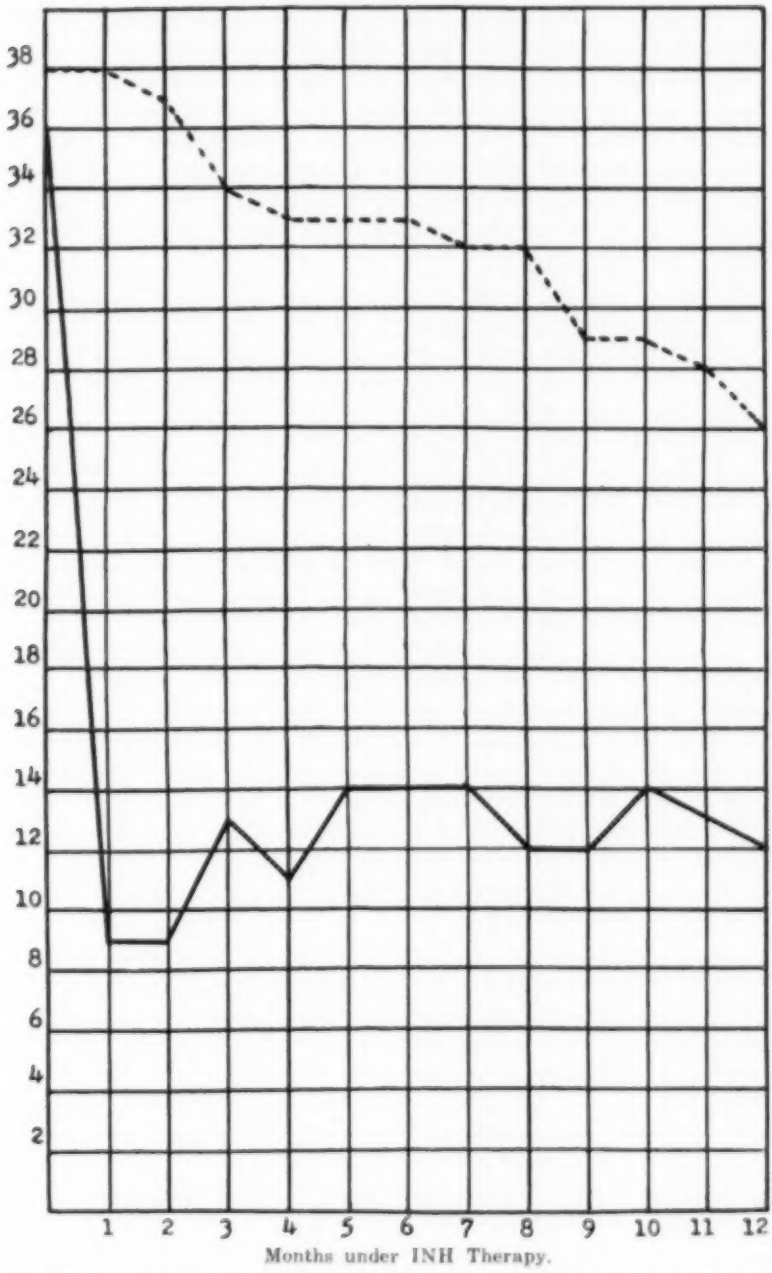

FIGURE 2: Incidence of Positive Sputum in Patients Being Treated with Isoniazid by Months under INH Therapy.

———— = Number of positive sputa.

..... = Patients remaining in study group.

of the year, three individuals felt that they were unimproved by isoniazid therapy, with reference to cough, sputum production, and appetite.

It should be mentioned that in two patients whose sputum remained positive, culture and guinea pig studies at the end of eight months of therapy were negative. In these two cases it appears that the bacillus may have been altered by isoniazid to such an extent that it was no longer pathogenic.

Discussion

In prescribing a medical regimen we wish to make it clear that we do not advocate the use of isoniazid alone as the therapeutic agent of choice. However, in such patients as here presented, on whom other therapy has failed due either to emergence of resistant organisms, too extensive disease, or patients too old for further surgery, isoniazid alone may be used to good advantage.

Many patients in the "maximum benefit" group feel hopeless, neglected, and often leave the hospital against medical advice. We have found isoniazid to have a beneficial effect on morale and in developing a sense of well-being in the chronic patient. In this study, six who had previously been adjudged "maximum benefit" cases, showed sufficient improvement on isoniazid to be discharged as arrested, three at slightly over nine months, and three at the end of one year. In all probability, there are many "good chronic" cases remaining in hospitals who have unsuccessfully undergone various therapeutic regimens and who might benefit by prolonged treatment with isoniazid alone.

The incidence of positive sputum was markedly decreased by the use of isoniazid. From a public health standpoint this is important, as many in the "maximum benefit" group often leave the hospital against medical advice. These patients would be potentially less dangerous as a source of infection in the community until such time as they could again be placed under medical care and supervision.

CONCLUSIONS

1. Thirty-eight "maximum benefit" or "good chronic" cases of pulmonary tuberculosis considered therapeutic failures to streptomycin and para-aminosalicylic acid, when treated with isoniazid alone for one year showed a promising clinical response.

2. Marked improvement in subjective symptoms such as morale and sense of well-being were noted from the onset of therapy. Improvement of appetite and weight gain were marked. Cough reduction and sputum volume reduction were striking. A sharp reduction in consumption of cough medicine paralleled the finding of cough and sputum reduction.

3. X-ray shadow improvement did not parallel clinical bettering. However, definite roentgenologic improvement was demonstrable, and after one year, six patients, heretofore considered to have poor prognosis for cure, were discharged from the hospital as arrested, with negative sputum.

4. An appreciable reduction in positive sputa was observed soon after institution of therapy. After one month of therapy the number with positive sputum decreased from 36 to nine. At any given time during the study the incidence of positive sputa among these patients was less than 50 per cent, whereas prior to therapy over 94 per cent were positive.

5. Isoniazid alone may have therapeutic efficacy in the management of "maximum benefit" or "good chronic" cases upon whom other therapeutic regimens have failed.

RESUMEN

1. Treinta y ocho casos de tuberculosis pulmonar que habíanllegado al "máximo de beneficio" o a la etapa de "buenos crónicos" y que se consideraban fracasos terapéuticos, después del uso de estreptomicina asociada al ácido paraminosalicílico cuando se trataron con isoniacida sola por un año, mostraron una respuesta prometedora.

2. Desde el principio se notó una mejoría subjetiva de síntomas, lo que condujo a una sensación de bienestar y de mejor ánimo.

La mejoría del apetito y aumento de peso fueron marcados. Lareducción del volumen del esputo fué notable.

Una notable reducción del consumo de medicinas para la tos, fué paralela a lo anterior.

3. La mejoría clínica no fué paralela a la mejoría radiológica. Sin embargo, pudo demonstrarse mejoría radiológica definida y después de un año, seis enfermos que hasta antes de este tratamiento se consideraban con mal pronóstico, salieron del hospital clasificados como detenidos con esputo negativo.

4. Pronto se vió una reducción de los esputos positivos después de instituido el tratamiento. Después de un mes de tratamiento el número de esputos positivos decreció de 36 a nueve.

En todo momento, durante este estudio la incidencia de los esputos positivos entre estos enfermos, fué de menos de 50 por ciento en tanto que antes era de 94 por ciento.

5. La isoniacida sola puede tener efectos terapéuticos eficaces en el tratamiento de los casos que han llegado a las etapas llamadas de "beneficio máximo" (entendiéndose por esta designación, los que no están curados, ya no pueden extraer del tratamiento mejoría ulterior) o los llamados "buenos crónicos" que se considerancomo fracasos de otros métodos.

RESUME

1. 38 cas de tuberculose pulmonaire chronique, considérés comme des échecs thérapeutiques à la streptomycine et au P.A.S. montrèrent une amélioration clinique pleine d'espoir après avoir été traités pendant un an par le seul isoniazide.

2. Dès le début du traitement, on nota une amélioration nette concernant les symptômes subjectifs, qu'ils s'agisse du moral du malade ou de sa

sensation de bien être. L'augmentation de l'appétit et du poids fut notable. Il y eut une réduction marquée de la toux et du volume de l'expectoration. On put réduire de façon nette la consommation de médications dirigées contre la toux, parallèlement à cette amélioration.

3. L'amélioration des constatations radiologiques ne suivit pas une courbe parallèle à l'amélioration clinique. Cependant des améliorations incontestables apparurent, et après un an, six malades jusque lá considérés comme ayant peu de chances de guérir purent quitter l'hôpital stabilisés et n'ayant plus de bacilles dans leur expectoration.

4. La disparition des bacilles dans l'expectoration survint rapidement après l'institution du traitement. Après un mois de traitement, il n'y avait plus que neuf malades au lieu de trente-six gardant une expectoration positive. Parli les malades ayant gardé une expectoration positive, celleci n'apparut telle que dans 50% de la total ité des examens, alors que ceux-ci se montrèrent positifs dans 94% avant la mise en oeuvre du traitement.

5. L'isoniazide seul peut avoir une action thérapeutique dans les cas chroniques pour lesquels les autres traitements ont été voués à l'échec.

Psychology of the Tuberculous from the Chest Physician's View Point

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During the past ten years a great deal of attention has been focused on the psychology of the tuberculous. We have heard claims of the part that can be played in modern sanatorium treatment by the psychologist, the neuropsychiatrist, the occupational therapist and the social worker. Only seldom have we heard anything of the part that can be played by the chest physician. Even if he can make no claim to be a trained psychiatrist he is bound to have opinions on the subject because of his contact with the patient during most stages of morbidity between the time of diagnosis and of re-establishment in the community. He will ask himself whether this approach to the patient is something entirely new, as previously outside his teaching and his acquired art, or is merely a specialized study of a part of his work taken out of his hands by the ancillary services with which he has been surrounded since the end of the second world war.

A study of the literature shows that the subject has attained prominence in those areas where full rehabilitation has become a new aim, or has suddenly developed from small beginnings that have remained static although they are traceable as far back as 40 years ago. The physician who cavils at the increasing status of the psychologist must admit to encouraging it; it has an exact parallel in the rising importance of the radiologist. By and large it is fair to say that while 30 years ago the art of our profession was more prominent than its science the position has been reversed. We have become so intent upon the physical and specific aspects that, whereas we previously treated the patient who had disease, we now tend to treat the x-ray of the disease in the patient. The warning of Sir Robert Philip in the 1880's that the Tuberculosis Services had found a "new pet" in the tubercle bacillus is paralleled in the recent statement of Dr. Pottenger that modern treatment of the early case of post-primary disease consists in the carrying of a bundle of x-rays. Meantime, the patient's attitude is changing; he is not satisfied, is much more critical, and often much more demanding.

Nor has the pathogenesis of the disease remained static. While over-all mortality has continued to decline, although we must frankly admit at no greater rate since the introduction of National Anti-tuberculosis Campaigns, morbidity does not decline in anything like the same proportion. We must be suspicious that the continuing mortality in early age groups of both sexes, the almost static mortality rate in young females, and the shift of mortality in males into the later 50's, may depend on some still unrecognized factor.

*Papworth Village Settlement.

Such a factor may bear some relation to the accelerating change in man's relations to his fellows; there is no doubt that the age of individuality is fast giving place to the age of communal life. Perhaps there is something more than chance in the emergence and growth of the psycho-somatic approach to morbidity. The purely scientific approach has not answered our problem; it does not disclose the man, however much it brings exactitude of diagnosis in both infecting organism and extent of pathological destruction of his tissues.

And yet, to the physician the psycho-somatic approach bristles with difficulties. On the purely somatic side we are conscious of, and perhaps even clouded by what we know of the ubiquity of primary infection; of hereditary resistance; of immunity and the rôle of environment in endogenous and exogenous reactivation of disease. Nevertheless, in a significant proportion of cases we are unable to ascribe breakdown to any one factor or any combination of these factors; if they are present then they are not apparent. Moreover, morbidity appears in every stratum of society and in every grade of intelligence.

Even the physician untrained in psychiatry suspects in a significant number of his patients a predisposing factor in some mal-adjustment to mental trauma: a psychological reaction present before diagnosis, often retrogressing and sometimes completely disappearing in the sanatorium of good morale and sometimes exaggerating in the sanatorium with cliques. Such reaction appears to be quite different from that following the trauma of diagnosis, or of treatment, or of both. Certainly we must pay more attention to the patient's life history; we must listen to it at least once, for we have all seen how often the patient improves when the sympathetic physician does nothing more than let his patient repeat over and over again the story of his pre-sanatorium hopes, fears and spiritual outlook. It is then we hear of the possessive mother, the over-ambitious father, the broken engagement or marriage, the unhappiness of working conditions, or the frustrated vision of the adolescent aesthetically and spiritually one stage higher than his family or of his colleagues, thrust on him by an environment he cannot control or escape. Due to one of these causes, or for some cause we cannot nominate, we now and again recognize the occupational obsessionist who drives himself outside the safe boundaries of healthy living, and we think we see in him a sample of disease that is in this case truly psycho-somatic in origin.

We read much about tuberculosis and genius. In my own experience I have never found any patient flattered or improved by the imposing list of names in this "club of the tuberculous." Many of the world's greatest poets are known to have suffered from tuberculosis. There may be some reason for believing that disappointment with the response to their vision was a factor in the development of their disease; there is no proof that they owed their powers to it. Toxaemia, temperature and consequent heightened metabolism may have acted as a spur to their greatest achievements, and had more effect on their output because of their recognition of their shortness of time for expression, but it is possible that in granting

even this we are overstressing the purely spontaneous element in artistic ability.

I have never been able to accept the doctrine that pulmonary tuberculosis is an escape mechanism. To my reading, such a theory endows the patient with the ability to choose a disease for which I have never found any enthusiasm. Strongly expressed disbelief I have seen, as well as anger, and even resignation because the diagnosis has been a confirmation of the patient's own fears, but I have never encountered any welcome for a diagnosis that usually hits with the power of a bludgeon, and is in itself too often the direct forerunner of a new mental trauma which has its origins in fear. Such fear can all too often be due in part to well-meant propaganda; certainly I prefer as a slogan "Tuberculosis is curable" to "Tuberculosis is an infectious disease."

The physician whose lot is to break the news that his patient is suffering from a previously unsuspected active tuberculosis has a heavy and frightening responsibility. To be too abrupt is just as blameworthy as to be optimistic. All of us know the difficulties of the sanatorium physician with the patient who has "come for three months." At the end of that time he either loses faith in medical advice, or, what is much more dangerous, he concludes that he is a case of progressive and hopeless disease to which he might as well succumb now as later. Nor must the physician talk down like an oracle using technical terms to a child. If he has listened carefully to the patient's story, he will have a fair idea of the personality with which he must deal, and this will be of greater importance as a guide to his choice of words than his physical examination. He will remember Sir William Osler's remark that "prognosis is more dependent on what the patient has in his head than on what he has in his chest," and in attempting to explain will respect his patient as an adult. I have often wondered how much the dependent and child-like attitude of the patient in the sanatorium has been due to the God-like attitude of his personal physician.

The "child to father" attitude of the sanatorium patient is easily overexaggerated. A certain amount of dependence is essential to all authority. "Mother was better immediately the doctor arrived" used to be a true statement in my youth in Scotland, and I hope it is still true in these days of our National Health Service. If this can be said of acute illness we must expect the same dependent attitude to be still more evident in chronic illness, and especially in pulmonary tuberculosis, where intervals of three months are the least time necessary for summations of progress of a disease which is seldom painful, and which compels the mind with any grade of intelligence above mental deficiency to an activity of which the individual is all the more conscious because of his enforced physical inactivity. Symptom swapping is an expected outlet; we should expect it rather than condemn it, for it is but a half-way stage towards the freedom lost by sanatorium routine. Rather do I believe in the approach of Dr. Wilmer, who recognises the need to help most patients towards an acceptance of the authority of doctors and nurses if we are to overcome the rebellion due to fears of intervention, from injection to resection. All

chronic illness brings a sense of frustration; in phthisis this is especially marked, since most patients are struck down either at the outset of their careers or at the stage when they are entitled to expect the best results from their training. The very insistence on rest, and more rest, is irksome to all but the very ill patient, and may well be the cause of the over-dependence occasionally present, and far too often assumed to be a trait of a pre-morbidity personality by many neuropsychiatrists who have no training in chest medicine or have never themselves suffered from the disease.

The inexperienced psycho-analyst can, I believe, be a positive danger. His nobility of aim to improve the personality of the patient is no justification for disturbing its balance. Granted he may disclose occasionally that the internal crisis which acted as a precipitating factor was a frustration of basic biological needs, yet history shows that such basic needs are but a part of man's complete personality. Man has shown continual craving, varying in degree, in every stage of civilization and in every social grade, for those equally powerful, extra-elemental forces of the esthetic and the moral, expressed in art, philosophy and religion. This is why we find large numbers of our patients uncover an unsuspected but real interest in Art Therapy. In any case we cannot make a new world to suit each patient. Every normal individual is subject to the stresses and strains of every-day life; all we can hope to do is to help our patient to adjust to these common stresses, and to the extra burdens his disease will impose on him for that length of time individual to himself that must pass before he can retake his place in community life with safety and self-respect.

A good antidote to the fears of the treatment and convalescent stages lies in occupational therapy. Many patients develop special emotional difficulties immediately they pass the acute stage of their illness, and must be aided to overcome them or sublimate them in some form of activity. Fear of being considered inferior in working capacity brings fear of insecurity, and this all too often leads to an inability to relax, and sometimes to a fierce assertion of independence that precipitates further breakdown. Occupational therapy is often the first step towards that active acceptance of disability that paves the only road to its conquest. It should lead, I believe, to therapeutic occupation as soon as possible. Unfortunately, all too often from the time of diagnosis the patient has instilled into him the necessity for rest; all too seldom does he have it explained to him that while rest is the treatment for active disease, to be carried out rigorously for a period that varies in accordance with individual needs, rest must be followed by activity if he is to have increased vitality. The static life of Plato's prescription for recovery, which is too often repeated to-day in the proverbial advice on discharge—"get a light job, avoid fatigue, get plenty of fresh air and use your leisure wisely"—is death in life to most men and women. Moreover, it presupposes economic security and complete internal equilibrium, both of which seem unobtainable to many sufferers dazed by the difficulties imposed by their disease.

It is here that the rehabilitation workshop can make a real contribution. The man who has been a patient-worker up to some six hours per day leaves for outside industry with an assurance that he can work without detriment to his general and his chest condition. He has progressed to this stage in a time that depended on his functional and on his physical disabilities. These are never synonymous, however, much though the former can be affected by the latter. Functional disability requires assessment in the same conditions as can overcome it: the actual conditions of industrial life, adapted and changed in sheltered workshops only insofar as they have the addition of constant watch on the physical and psychological response of the individual worker.

I am old-fashioned enough to believe that all attempts to deal with the psychology of the tuberculous fail insofar as they set themselves up as a substitute for, and not as a complement to, religion. While it is equally dangerous to let loose in the sanatorium the priest who gives non-medical exhortations on psychiatry as to allow the atheist psycho-analyst to advise the devout Christian, I am convinced that the best friend of the patient and of his sanatorium physician is the understanding minister of religion. Through him we have the disciplines of religion in self-control balanced with the superimposed authorities of medicine in the humane application of sanatorium routine. No matter how often our materially-minded economists repeat their half-truth that happiness has its real basis in a planned security, history shows clearly that without ritual, myth or religion, man must die. Here the words which Shakespeare put in the mouth of Lady Macbeth's physician are, I believe, particularly apt: "More needs she the divine than the physician." Equally did Talleyrand state a profound truth when he wrote "The main instruments of healing—prevention, respect, faith and gratitude. The wounded who have received consolation, the sick who have been persuaded to hope, are already in a state to be cured."

The sanatorium which relies on a fixed regime, however good, and believes it has reached perfection merely by employing the latest mechanical aids may succeed in preserving life, but will not renew it, for it has forgotten that the human end of treatment is above all non-human technical processes. Every chest physician knows that a thoracoplasty performed as a last hope on the patient fortified with the consolations of religion that produce the quiet mind, has a far better chance of success than the so-called ideal operation which has been accepted in a state of desolation and defeat. To me the neuroses and the search for the occult in the sanatorium are but parallels to the demands for aspirin and barbiturates seen in general practice, as all too often the evidence of craving to fill the vacuum created by loss of faith, and in particular loss of faith in the teachings of the Church. For faith is the fuel of the spirit; without it the vital fire dies down, and can die out. It is still true that "where there is no vision the people perish."

SUMMARY

To my reading, therefore, this interest in the psychology of the tuberculous is evidence of the wish of our profession to return to the study of man in his wholeness as he was seen by the early Christian physician, and was treated in the first hospitals of the Christian Church. The priest and the doctor long ago took separate roads in their approach to the complete man, the priest concentrating on the soul, the doctor on the body, each more and more jealously retaining his part of the whole, and only seldom meeting on what has now been recognized as common ground for both, the mind of man, through which he translates his spiritual experiences and his bodily reactions. I believe the conjunction of their forces holds great promise for the future; it will avoid for both the dangers of unscientific quackery and the mass hysteria of bogus "spiritual healing"; and make possible a further and welcome advance in the field of preventive medicine.

RESUMEN

De acuerdo con mi información, este interés en la psicología del tuberculoso es una evidencia del deseo de neustra profesión de volver al estudio integral del hombre tal como fué considerado por el médico cristiano primitivo y como fué tratado en los primeros hospitales de la Religión Cristiana. El sacerdote y el médico hace mucho tiempo que siguieron caminos separados en su relación con el hombre completo, el sacerdote dedicándose al alma y el médico al cuerpo, y cada uno delos dos reteniendo celosamente su parte del todo sólo rara vez,—reuniéndose en lo que ahora se ha reconocido como la base para ambos: la mente humana, a través de la cual el hombre traduce su experiencia espiritual y sus reacciones corporales.

Creo que la conjunción de la fuerza de ambos, mantiene una gran promesa para el futuro; para ambos evitará los peligros de el charlatanismo anticientífico de la histeria de masas de la llamada "curación espiritual;" y aún hacer posible un avance deseable en el campo de la medicina preventiva.

RESUME

L'intérêt qui se manifeste maintenant pour la connaissance de la psychologie du tuberculeux révèle le désir que l'on a, dans notre profession, de revenir à l'étude de l'homme tel que l'envisageait le médecin des premiers temps du Christianisme, et tel qu'on le traitait dans les premiers hospices religieux de la chrétienté.

Il y a longtemps que le prêtre et le médecin ont pris des chemins séparés pour étudier l'homme, le prêtre s'attachant à l'âme et le médecin au corps. Ils gardaient chacun jalousement leur domaine, ne se rencontrant que rarement sur le terrain qui a été maintenant reconnu commun pour l'un et l'autre, l'intelligence de l'homme, grâce à laquelle il traduit à la fois ses expériences spirituelles et ses réactions corporelles.

L'auteur pense fermement que l'union de ces deux éléments sera très fructueuse pour l'avenir. Ainsi pourra être évité pour tous les deux le danger d'un charlatanisme contraire à la science et de l'hystérie collective d'une fausse guérison par l'esprit. Ainsi sera réalisé un heureux progrès dans le champ de la médecine préventive.

Nisentil* As an Analgesic in Bronchoscopy

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A satisfactory bronchoscopic procedure under local anesthesia requires adequate sedation to allay apprehension and effective analgesia to permit manipulation of the bronchoscope. Barbiturates administered prior to the instillation of a local anesthetic usually provide sufficient sedation and have been adopted as a routine by many. The list of analgesics used in bronchoscopy is on the other hand long and varied, and is constantly being revised as new agents are introduced. It was in this connection that alphaprodine (Nisentil*) was subjected to clinical trial in the bronchoscopy clinic of the Tuberculosis Service, Los Angeles County General Hospital.

Alphaprodine is a synthetic analgesic piperdine derivative first reported by Ziering and Lee[1] in 1947. The satisfactory effect of this drug in relieving pain in patients with inoperable cancer was reported by Houde, Rasmussen and La Due.[2] It was also used by Smith and Nagyfy[3] in obstetrical cases with good analgesic effect. These observers also noted that repeated administration of the drug was possible because of its short duration of action. Kane[4] administered it to 1000 obstetrical cases and obtained satisfactory analgesia in 98.1 per cent of the deliveries.

Material and Method

This report presents the results obtained with alphaprodine in 119 consecutive bronchoscopies. Local anesthesia and analgesia were customarily induced as follows: One hour prior to bronchoscopy a barbiturate was given orally. Topical anesthesia was induced by gargling with 5 cc. of a ¼ per cent pontocaine solution, and the instillation of 8 cc. of a ½ per cent solution of pontocaine into the larynx over a period of 15 minutes. Nisentil was then administered subcutaneously 15 minutes before bronchoscopy, since full effect of its analgesic action was customarily obtained within that time. The dosage of the analgesic and that of the pre-anesthetic barbiturate, sodium pentobarbital, is shown in Table I.

TABLE I
Dosage

Cases	Nisentil	Sodium Pentobarbital
16	15 mg.	3 grains
98	30 mg.	1½ grains
5	60 mg.	3 grains

*Supplied by Hoffmann-La Roche Inc., Nutley, N. J.
**From the Tuberculosis Service, Los Angeles County General Hospital.

The age of the patients in this series varied widely, a majority being more than 50 years old. The clinical diagnoses and indications for bronchoscopy were rather diverse and are given in Table II.

TABLE II

Diagnoses or Indications for Bronchoscopy

Bronchial tuberculosis	18
Broncho-pulmonary suppurative disease	22
Bronchogenic neoplasm	13
Pulmonary hemorrhage	2
Non-specific bronchitis	3
Negative endobronchial tree	51
Biopsies	13
Bronchial dilation	7

Results

The analgesic effect was graded good, fair or poor by the bronchoscopist immediately following the procedure (See Table III).

TABLE III

Analgesic Effect

Nisentil (Subcutaneous)	Sodium Pentobarbital (Oral)	Number of cases	Good	Fair	Poor
15 mg.	3 grains	16	3	13	0
30 mg.	1½ grains	98	95	0	3
60 mg.	3 grains	5	4	0	1

The analgesia produced by 15 mg. of alphaprodine and 3 grains of sodium pentobarbital was considered fair, while that obtained with 30 mg. of the analgesic and 1½ grains of sodium pentobarbital was rated as good, (50 of the 98 cases had a satisfactory analgesic effect). Of the five cases that received 60 mg. of alphaprodine and 3 grains of sodium pentobarbital, four had a good analgesic effect; but two patients in this last group exhibited undesirable side effects manifested by apnea and cyanosis which was relieved by the administration of oxygen and respiratory stimulants. Both of these patients were more than 60 years of age and were apparently over medicated by the combination of 3 grains of sodium pentobarbital and 60 mg. of the narcotic. When overdosage was avoided the only side effects noted were those of dizziness and nausea in about 10 per cent of patients. These were mild and transitory, and did not require treatment.

The suppressive effect of alphaprodine on the cough reflex was not evaluated in this study. The observation volunteered by our head nurse in charge of the bronchoscopy clinic, does however appear worthy of mention. She notes that coughing during and immediately following bronchoscopy is much reduced since alphaprodine has replaced morphine and demerol as the analgesic. Investigation of this property of alphaprodine seems desirable.

Discussion

Among the requisites of an ideal analgesic for bronchoscopy one might include the following:

(a) Rapid induction.

(b) Effective relief of pain.

(c) Non-interference with the patient's ability to cooperate during the procedure.

(d) A total duration of action not significantly longer than that of bronchoscopy.

(e) A minimum of side and after effects.

Alphaprodine has an induction time of 10 to 15 minutes; it proved an effective analgesic agent in 96 per cent of the 119 bronchoscopies in this series; it did not interfere with the patient's ability to cooperate; its duration of action was approximately 2 hours; its side effects were limited to a mild transient dizziness occurring in about 10 per cent of the patients; and it left no after effects. It would appear therefore that this synthetic narcotic is certainly worthy of consideration as an analgesic in bronchoscopy.

Of the dosage schedules employed, 30 mg. of alphaprodine preceded by 1½ grains of sodium pentobarbital gave the best results. Admittedly this may not be the optimal routine dosage. Other dosage schedules are being considered but have not as yet been evaluated. The use of 60 mg. of the narcotic and 3 grains of sodium pentobarbital may result in pronounced respiratory depression, particularly in older patients.

SUMMARY

1. Alphaprodine was used in 119 bronchoscopies with satisfactory analgesia in 96.6 per cent.

2. Best results were obtained with 30 mg. of the narcotic injected subcutaneously, preceded by sodium pentobarbital, 1½ grains, orally.

3. Side effects were minimal, consisting of mild, transient dizziness and/or nausea, occurring 10 or 15 minutes after administration and clearing spontaneously in a few minutes. The retching and/or vomiting encountered with morphine and some synthetic narcotics were singularly absent.

4. When alphaprodine and a barbiturate are used in conjunction a synergistic depression of respiration results.

5. This drug appears to be an acceptable analgesic agent for bronchoscopy. It provides prompt and effective analgesia, has a short duration of action, and leaves a clear sensorium.

RESUMEN

1. Se usó la Alfaprodina en 119 broncoscopias y se obtuvo analgesia satisfactoria en el 96.6 por ciento.

2. Los mejores resultados se obtuvieron con 30 miligramos del narcótico inyectados subcutáneamente precedidos de uno y medio granos de pentobarbital sódico, por vía oral.

3. Los efectos colaterales fueron mínimos consistentes en moderada sensación de mareo y/o náusea después de 10 o 15 minutos de la administración, lo que desapareció espontáneamente en pocos minutos.

4. Cuando se administran la alfaprodina y un barbitúrico conjuntamente, resulta una sinérgica depresión de la respiración.

5. Parece que esta droga es un analgésico aceptable para la broncoscopía. Proporciona pronta y efectiva analgesia, tiene corta duración de acción y no afecta el sensorio.

RESUME

1. L'auteur a été très satisfait de l'analgésie obtenue par l'alphaprodine dans 96,5% des 119 bronchoscopies qu'il a pratiquées à l'aide de ce produit.

2. Les meilleurs résultats furent obtenus par injections sous-cutanées de 30 mmgr. du produit précédées par l'administration par voie buccale de pentobarbital de soude.

3. Les effets secondaires se montrèrent négligeables. Ils consistèret en vertiges légers et transitoires, et en un état nauséeux, associé ou non à ces vertiges, survenant dix à quinze minutes après l'injection, et disparaissant spontanément en quelques minutes. Les nausées et vomiseements auxquels on est exposé lorsqu'on utilise la morphine ou certains anesthésiques synthétiques ont manqué totalement avec ce procédé.

4. Quand l'alphaprodine et un barbiturique sont utilisés simultanément, il en résulte une dépression respiratoire.

5. Ce produit semble être un analgésique très bien adapté à la bronchoscopie. Il détermine une insensibilité rapide et réelle a une action de durée très limitée, et laisse à sa suite un état psychique intact.

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The Effects of Pulmonary Infection on Cardiorespiratory Functions in Chronic Emphysema.*

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Investigations of cardiorespiratory functions in pulmonary diseases have in recent years contributed much to the understanding of the development of pulmonary heart disease. Harvey et al.[1] in a recent publication have stressed the importance of anoxia in patients with chronic pulmonary emphysema as a cause for the deterioration of heart function. According to them, acute anoxia may precipitate the development of congestive heart failure and the relief of anoxia may bring about marked improvement in cardiac function. The main causes of acute anoxia may be bronchial obstruction and acute pulmonary infection.

Two cases of emphysema were recently observed in which the development of acute pulmonary infection and anoxia was associated with congestive heart failure. Recovery from the infection and anoxia was accompanied by regression of the signs of congestive heart failure. In one case, also, the interesting effects of treatment with adrenocorticotropic hormone on pulmonary functions in the different stages of pulmonary emphysema were recorded.

Methods

Pulmonary function tests: Lung volumes and maximum breathing capacity were measured by the spirographic technique.[2] All the data were calculated to 37° C., saturated and prevailing barometric pressure. The predicted vital capacity and maximum breathing capacity were calculated by the formulas of Baldwin et al.[3] Arterial blood gases were determined by the method of Van Slyke and Neill.[4] Blood was obtained from the brachial artery using an indwelling Cournand-type needle. The blood was collected by the technique of Riley et al.[5] using heparin to prevent clotting and a small globule of mercury in the syringe for proper mixing. Exercise tests on the Master two-step stairs were performed during three minutes.[6] 100 per cent oxygen breathing was maintained for three minutes. Venous pressure was measured by the direct Moritz and Tabor method. Circulation time was determined with decholin. ACTH was given by intravenous drip infusion of small doses.[7, 8]

Case 1: Z. M., a 45 year old male was admitted to the hospital on May 25th, 1952, for the fifth time. The chief complaints were fever, cough and shortness of breath. His past history revealed that for many years he had suffered from attacks of respiratory infections and bronchial asthma. A diagnosis of obstructive emphysema and spastic bronchitis had been made. On previous admissions the chief findings were cyanosis, wheezing and bronchial rales over both lung fields. The heart was not

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TABLE I

		ARTERIAL BLOOD										PULMONARY TESTS										
		CO_2 Content Volume %			O_2 Content Volume %			O_2 Saturation %														
	Date	Before Exercise	After Exercise	After O_2 Breathing	Before Exercise	After Exercise	After O_2 Breathing	Before Exercise	After Exercise	After O_2 Breathing	O_2 Capacity Volume %	Vital Capacity per Litre	% of Prediction	Tidal Air	Compl. Air	Reserve Air	Maximum Breath. Capacity per Litre	% of Prediction	Breathing Res. Ratio	Ventil. Litres per Minute	O_2 Consumption c.c./Minute	Resp. Rate
ACTH	Before 10/22/50											1.10	25	0.51	0.92	0.20	19.06	17	0.55	8.47	253	25
	After 11/3/50											1.49	34	0.51	1.19	0.30	25.43	22	0.66	8.47	261	25
Pulmonary	5/27/52	61.32			13.23			55.20			23.98	0.90	21	0.30	0.60	0.30	14.92	13	0.48	7.52	150	26
Infection	6/1/52	66.67		62.91	16.42		20.98	69.70		90.10	23.57											
	6/4/52											1.35	31	0.33	0.88	0.47	14.92	13	0.66			
	6/10/52	57.77			19.20	19.43		85.20	86.20		22.50	1.43	33	0.52	1.05	0.38	21.55	19	0.68	7.20	134	14
ACTH	6/19/52	57.62	53.24		19.37	18.60		83.0	80.0		23.17	1.15	26	0.38	0.95	0.20	16.58	15	0.58	6.87	165	19
Control	11/20/52	58.48	57.31	60.0	17.64	17.53	20.08	87.0	86.5	99.0	20.30	1.41	32	0.46	1.17	0.58	18.98	16	0.49	9.66	175	30

TABLE II

	ARTERIAL BLOOD										PULMONARY TESTS										
	CO_2 Content Volume %			O_2 Content Volume %			O_2 Saturation %			O_2 Capacity Volume %	Vital Capacity per Litre	% of Prediction	Tidal Air	Compl. Air	Reserve Air	Maximum Breathing Capacity per Litre	% of Prediction	Breathing Res. Ratio	Ventil. Litre per Minute	O_2 Consumption c.c./Minute	Resp. Rate
Date	Before Exercise	After Exercise	After O_2 Breathing	Before Exercise	After Exercise	After O_2 Breathing	Before Exercise	After Exercise	After O_2 Breathing												
12/17/52	66.32	67.59	66.58	13.42	11.89	18.40	71	63	98	18.6	1.02	30	.2	.69	.32	15.53	16	.64	5.53	180	44
12/22/52	61.50	64.62	66.76	15.17	12.90	18.04	82.5	70	98.5	18.96	1.19	36	.24	.91	.27	15.53	16	.47	8.29	208	41
12/26/52											1.17	35	.27	.77	.41	17.25	19	.46	9.32	358	48
12/28/52	58.01	55.45	59.76	14.83	14.27	16.61	83	80	93	18.22	1.50	45	.26	.94	.56	17.25	19	.50	9.69	262	49
1/7/53	46.39	44.38	46.29	18.15	18.26	20.0	90	90.5	97	20.61	1.62	50	.22	.65	.97	32.78	39	.53	15.3	248	62

enlarged, but the electrocardiogram showed signs of right ventricular strain. Circulation time and venous pressure were normal. The red blood cell count was 5,500,000. Three weeks before his present admission he noted fever which persisted until admission. During this period he suffered from severe cough, marked shortness of breath, severe headaches and pounding sensations in his head.

Physical examination disclosed a well nourished male, propped up in bed; temperature 38.8° C; pulse 120 per minute; blood pressure 120/70; respirations 28 per minute. He appeared acutely ill and was dyspneic at rest. There was marked cyanosis of the face, lips, ears and fingers. The neck veins were markedly congested. The area of cardiac dullness could not be exactly determined because of the marked emphysema. The heart sounds were normal; the second pulmonic sound was accentuated. The chest was barrel shaped with practically no expansion and the lung borders were lower than normal. The breath sounds were distant over both lungs with a prolonged expiratory phase. There were sibilant and sonorous ronchi. Over the lower half of the right lung field, coarse and medium crepitations were heard. The liver edge was three finger-breadths below the costal margin and tender. The spleen was two finger-breadths below the costal margin. The extremities were normal. There were "watchglass" nails.

Laboratory data—Urine analysis, normal; R.B.C. 6,810,000; hemoglobin, 17.5 g. per cent; hematocrit, 60; leucocytes, 18,100 with 60 per cent neutrophiles, 1 per cent eosinophiles, 1 per cent basophiles, 30 per cent lymphocytes and 8 per cent monocytes. Sedimentation rate was 3/5 Westergreen. Kahn serological test was negative. Blood urea, sugar and protein were normal. A sputum culture revealed N. catharralis and staphylococcus citreus.

X-ray film of the chest on admission showed diffuse cloudiness in the lower part of the right lung, increased markings of the hila and a small amount of fluid in the right costophrenic sulcus. The electrocardiogram showed sinus tachycardia, P pulmonale and signs of right ventricular hypertrophy. Circulation time was 15 sec.; antecubital venous pressure 22.5 cm. H_2O.

The presumptive diagnosis was bronchopneumonia, emphysema and spastic bronchitis.

Treatment with penicillin, 600,000 units daily, was instituted and oxygen was administered intermittently. On the third day after admission phlebotomy of 350 cc. was performed. On the same day the temperature dropped to normal and his condition started to improve. On June 1st, six days after admission, the venous pressure was 11 cm. H_2O and the liver edge was now palpable one finger-breadth below the costal margin. On June 5th, the x-ray showed clear lung fields. The clinical improvement continued, and on June 15th the venous pressure was 6.5 cm. H_2O. He had lost 3 kg. in weight and was discharged in a markedly improved condition.

Pulmonary Function Tests

The results are summarized in Table I. The ventilatory function tests performed seven months before his present admission showed a marked reduction in vital capacity and maximum breathing capacity which were 25 and 17 per cent respectively of the predicted normal values. At the time of his present admission vital capacity and maximum breathing capacity had decreased further to 21 and 13 per cent respectively of the predicted normal values. The expiratory slope of the spirogram was markedly prolonged (Fig. 1). The oxygen saturation of the arterial blood was 55.2 per cent and the CO_2 content was 61.32 Vol. per cent. Four days later, after the temperature dropped to normal, the oxygen saturation rose to 69.7 per cent and the CO_2 content was 66.67 Vol. per cent. After breathing 100 per cent oxygen, the saturation rose to 90 per cent. Two weeks after his admission the oxygen saturation was 85.2 per cent and the CO_2 content had dropped to 57.7 Vol. per cent. After exercise the oxygen saturation rose to 86.2 per cent. Marked improvement in ventilatory function was manifested by the increase of vital capacity and maximum breathing capacity, which were now 33 and 19 per cent respectively of the predicted normal values. The expiratory slope of the spirogram was still very pro-

longed (Fig. 1). At a control examination five months later, nearly the same values were obtained. The oxygen saturation was now 86.5 per cent and rose to 99 per cent after oxygen breathing.

Effects of ACTH Treatment

Treatment with adrenocorticotropic hormone during his previous admission half a year ago, caused marked improvement in the ventilatory function tests. The vital capacity and maximum breathing capacity increased by 9 and 5 per cent respectively of the predicted normal values (Table I). The same treatment during his present admission, after recovery from congestive heart failure, caused a decrease in the vital capacity from 33 to 26 per cent and in the maximum breathing capacity from 19 to 15 per cent. The oxygen saturation decreased from 85.2 to 83 per cent and after exercise it dropped further to 80 per cent.

Comment

This patient was known to have suffered for years from chronic bronchitis and obstructive emphysema. Signs of myocardial decompensation had not been seen previously. During his present admission, a diagnosis was made of pneumonia accompanied by an exacerbation of chronic bronchitis. The acute infection caused a marked deterioration of pulmonary function, manifested by reduction of ventilatory function tests, carbon dioxide retention and anoxia. The chief cause of the anoxia was apparently pneumonia associated with a large area of unventilated but well perfused lung parenchyma. This probably caused an admixture of unoxygenated venous blood from the pulmonary artery with blood from well ventilated alveoli, a situation analogous to a veno-arterial shunt, as seen in congenital heart disease.[9, 10, 11] The fact that breathing of 100 per cent oxygen increased the oxygen saturation only to 90 per cent speaks in favor of this assumption and makes it improbable that the arterial oxygen unsaturation was due only to faulty distribution or diffusion.[12] It should

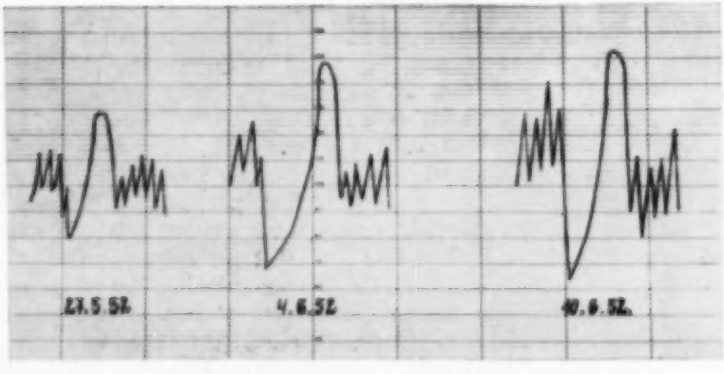

FIGURE 1. *Case 1:* Spirograms in the course of the disease, showing an increase in the vital capacity without marked change in the contour of the expiratory slope.

be pointed out that five months later the oxygen saturation after 100 per cent oxygen breathing rose to 99 per cent.

At the time of the pulmonary infection signs of congestive heart failure appeared for the first time. With the recovery from the pulmonary infection, the anoxia gradually diminished and the oxygen saturation rose to the same level as at his control examination and the ventilatory function tests improved markedly. The presence of some oxygen unsaturation even after clinical recovery from the pulmonary infection might be explained by the continuation of pulmonary consolidations and spastic bronchitis. Pulmonary infiltrations have been frequently observed by x-ray studies and confirmed by pathological examinations even after the temperature has dropped to normal, because of the slow resorption of the alveolar exudates.[13] The above observations suggested that in this case pneumonia with an accompanying veno-arterial shunt was the main cause of the pulmonary dysfunction and anoxia.

The different responses to treatment with adrenocorticotropic hormone in two different stages of the disease was well demonstrated in the lung function tests. On his previous admission, when the presenting disease was bronchial asthma without signs of heart failure, treatment with ACTH caused marked improvement. At his present hospitalization, when the patient was recovering from a bout of congestive heart failure, the same treatment led to a reduction of the ventilatory function tests and an impairment of the respiratory function tests. The cause for this deterioration might be sought in the increased tendency for salt and water retention during this particular phase of the disease, which probably resulted in interstitial edema and pulmonary insufficiency. This notion conforms with the observations of Lucas and Galdston et al., who also found a deterioration of pulmonary function after treatment with ACTH in cases with pulmonary heart disease.[14, 15]

Case 2: M.K., a 65 year old male Jew, was admitted on December 12th 1952, because of shortness of breath and cough. It was not possible to get a detailed history from him or his relatives. He was living in poor economical conditions and had suffered coughing attacks for years.

At the time of admission his temperature was 36.9° C.; pulse 104; blood pressure 125/85; respiratory rate 44; weight 70.6 kg. He was dyspneic and orthopneic. There was marked cyanosis of the face, lips, fingers and toes. The fingernails had a "watch-glass" appearance. The neck veins were markedly distended. The chest was barrel shaped and extended poorly bilaterally. The breath sounds were vesicular with prolonged expiration and there were diffuse bronchitic rales. Over the right lung base there was an area of dullness of three fingers breadth with bronchial breath sounds and crepitations. The heart was enlarged in all directions; there were no murmurs; the second pulmonary sound was accentuated. The liver edge was five finger-breadths below the right costal margin and tender. There were ascites and three plus pretibial edema.

An x-ray film of the chest (Fig. 2A) showed dilatation of the right and left heart with straightening of the left border and prominence of the right lower border; increased pulmonary hilar markings; especially on the right side; a density in the right lung base and fluid in the right costophrenic sulcus. The electrocardiogram showed P pulmonale and right ventricular hypertrophy.

On admission the red cell count was 4,900,000; hemoglobin 14.0 g. per cent; hematocrit, 52; leucocytes, 24,400 with 59 per cent neutrophiles, 2 per cent bandforms, 4 per cent eosinophiles, 34 per cent lymphocytes and 1 per cent monocytes. The urine showed 2+ positive albumin, some leucocytes and erythrocytes. The sedimentation rate was ½ Westergreen. The Kahn serological test was negative. The blood urea was 52 mg. per cent; blood sugar 87 mg. per cent; Nacl, 525 mg. per cent; protein, 5.85 g. per cent; albumin, 3.2 g. per cent and globulin, 2.65 g. per cent. Circulation

time was 22-sec.; venous pressure on admission was 22 cm. H_2O. Three days after admission his temperature rose to 38° C. and after three days dropped to normal. The presumptive diagnosis was bronchopneumonia, emphysema and spastic bronchitis.

On the first day after admission, because of his serious condition, the patient was given 2 cc. of a mercurial diuretic and a phlebotomy of 400 cc. was performed. He was placed on a low salt diet, was given 0.9 g. aminophyllin daily, oxygen was administered intermittently and penicillin treatment was instituted. On the sixth hospital day digitalization was begun. He received 16 ccm. digilanide during a period of three days and thereafter 0.1 mg. digitoxin daily orally. Eight days after admission his condition started to improve, the cyanosis decreased, urine output increased and the edema began to regress. On December 23rd, the venous pressure was 16 cm. H_2O and the circulation time was 14 sec. During the following two weeks his weight dropped from 67.0 kg. to 53.0 kg. All the signs of congestive heart failure disappeared and there was no visible cyanosis. The venous pressure dropped to 5 cm. H_2O. The physical signs over the lungs became normal. A control x-ray film on January 2nd, 1953 (Fig. 2B) showed a normal size and configuration of the heart with clear lung fields, increased hilar markings and evidence of emphysema. The electrocardiogram revealed again right ventricular hypertrophy.

Pulmonary Function Tests

The results are summarized in Table II. The first examination was performed four days after his admission. The ventilatory functions tests showed marked reduction. The maximum breathing capacity was 16 per cent and the vital capacity 30 per cent of the predicted normal values. The spirogram exhibited a marked prolongation of the expiratory slope (Fig. 3). The oxygen saturation of the arterial blood was 71 per cent at rest and dropped to 63 per cent after exercise. After breathing 100 per cent oxygen the saturation rose to 98 per cent. The carbon dioxide in the blood was 66.3 Vol. per cent, indicating marked retention. Five days later the arterial oxygen saturation rose to 82.5 per cent and exercise caused a drop to 70 per cent. Eleven days after the first examination the vital capacity rose to 45 per cent of the predicted value. The oxygen saturation was now 83 per cent and exercise caused a drop to 80 per cent. On January 7 the ventilatory tests showed further improvement. The vital capacity was now 50 per cent and the maximum breathing capacity 30 per cent of the predicted normal

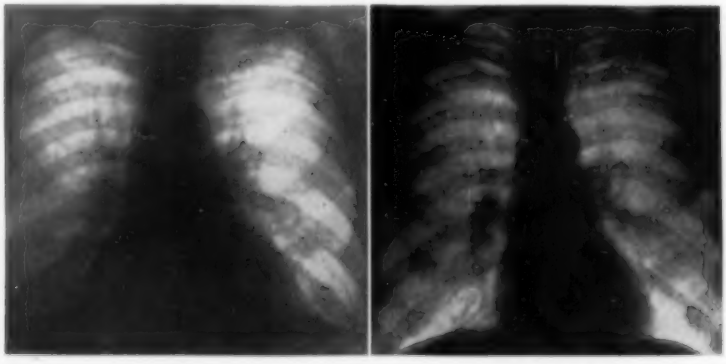

FIGURE 2A FIGURE 2B

Figure 2A, Case 2: X-ray film of the chest on admission. See text. *Figure 2B, Case 2*: X-ray film after recovery. See text.

values. The spirographic tracing showed a normal expiratory slope (Fig. 3). The arterial oxygen saturation was now 90 per cent, rising after exercise to 90.5 per cent and the carbon dioxide content was normal.

Comment

This patient was admitted to the hospital in a state of severe cardiac failure and dilatation of the heart. On the basis of clinical and x-ray findings, a diagnosis of spastic bronchitis and pneumonia was established. There was marked reduction of the ventilatory function tests, oxygen unsaturation and carbon dioxide retention. The spirogram showed a marked prolongation of the expiratory slope indicating bronchial obstruction. The oxygen unsaturation was corrected by the administration of 100 per cent oxygen, which justified the assumption that the main cause for the anoxia was faulty distribution or diffusion of air. With the subsidence of the pulmonary infection there was a gradual improvement in the ventilatory function tests and also the expiratory slope became normal, indicating relief from the ventilatory obstruction. The arterial oxygen saturation gradually returned to normal values and the carbon dioxide retention decreased. Accompanying the improvement of the pulmonary functions, the signs of congestive heart failure disappeared, the venous pressure and the circulation time became normal, the urine output increased and there was a marked loss in weight. The x-ray films revealed now a normal configuration of the heart. Table III illustrates the correlation between some pulmonary tests, circulatory measurements and the body weight. The lack of polycythemia in this case might be explained by the poor nutritional state, indicated also by the low blood protein levels. It might be assumed that the chief cause of the acute deterioration in the pulmonary functions in this case was bronchial obstruction, since the anoxia was completely corrected by oxygen breathing and the expiratory slope became normal after recovery from the acute infection.

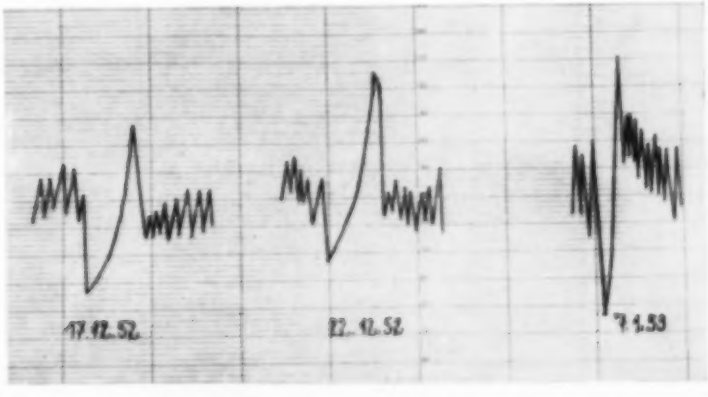

FIGURE 3, *Case 2:* Spirograms in the course of the disease showing an increase in the vital capacity and a normalization of the expiratory slope.

Discussion

Two patients are presented with signs and symptoms of severe cor pulmonale. In both of them chronic bronchitis and emphysema were present before the appearance of the current disease. Acute pulmonary infection, in one case predominantly pneumonia, in the other predominantly severe obstructive bronchitis, precipitated the appearance of severe congestive heart failure. In these two patients the preexisting chronic lung disease

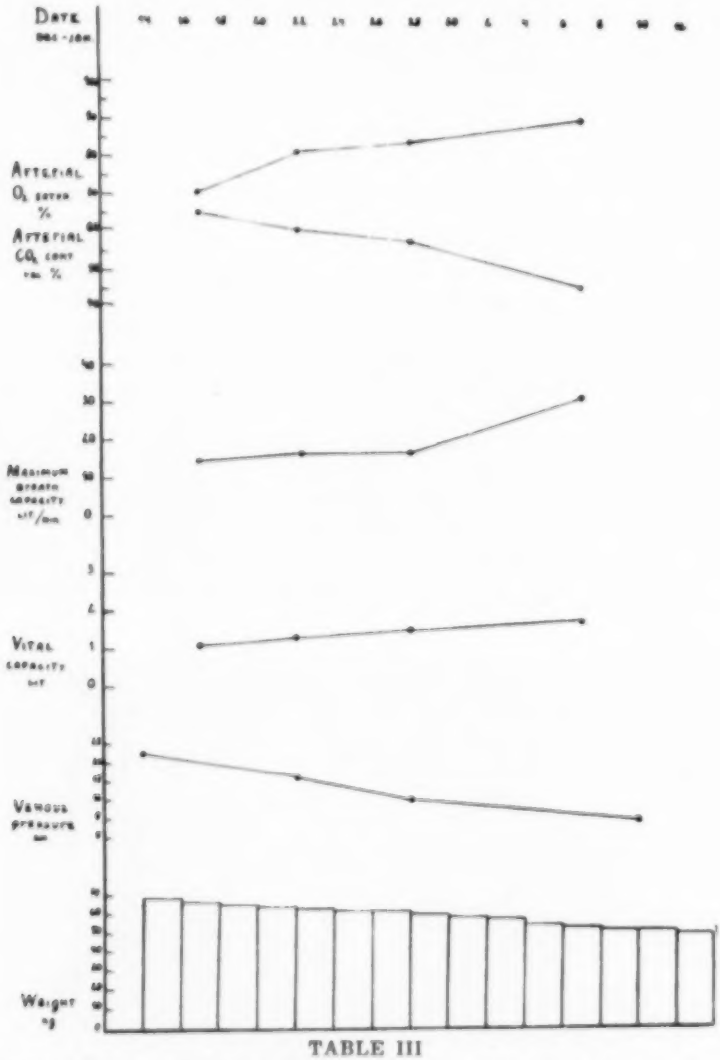

TABLE III

Correlation between circulatory measurements, some pulmonary function tests and body weight.

had probably caused a reduction of the pulmonary vascular tree, long before the appearance of heart failure. This reduction resulted in an increased load on the right ventricle and induced right ventricular hypertrophy which was demonstrated in the electrocardiograms taken before and after the present acute illness.

Three factors were probably responsible for the development of acute congestive heart failure in these cases who suffered from chronic emphysema:

I. The decrease of the functional pulmonary parenchyma as a result of pneumonia and bronchial obstruction caused further diminution of the already reduced pulmonary vascular tree and thus a greater resistance in the pulmonary circuit. These factors were well demonstrated by the marked reduction of the pulmonary function tests, manifested by the low vital capacity and maximum breathing capacity.

II. The fever, induced by the pulmonary infection, caused a rise in the oxygen consumption as a result of increased metabolic requirements. This rise in oxygen consumption is generally accompanied by increased cardiac output, which in turn may lead to an increased pulmonary blood flow and embarrassment of the pulmonary circulation.

III. The third factor and probably the most important one was the anoxia. It has been shown that anoxia, apparently by direct action on the pulmonary vessels, augments their vasomotor tone and thereby increases the pulmonary artery pressure.[16, 17] This effect should be more marked in patients in whom there is already a reduction of the pulmonary vascular bed. Other sequelae of anoxia include hypervolemia, increased cardiac output and polycythemia. The first two of these latter increase the volume of blood in the pulmonary circulation and limit further the

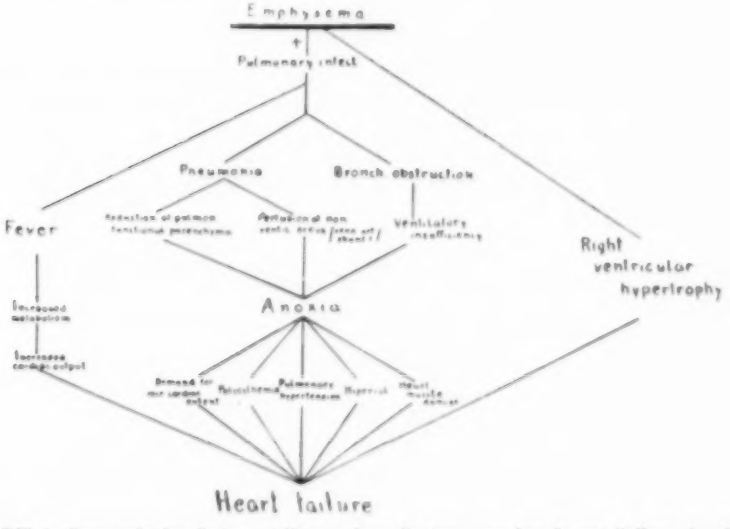

FIGURE 4: Interrelation between the various factors causing heart failure in chronic pulmonary disease complicated by pulmonary infection.

capacity of the pulmonary vascular bed. Polycythemia,[18, 19] with increased blood viscosity, augments the resistance to flow and raises the pulmonary artery pressure. These various mechanisms combine to produce pulmonary hypertension. Right ventricular dilatation and cardiac failure result when the hypertrophied right ventricle, whose function is impaired by the direct action of the anoxia on the myocardium, is no longer capable of coping with the overload of the increased pulmonary resistance and the demand for increased cardiac output.[20, 21]

The interplay of these various mechanisms in the genesis of heart failure is illustrated in Fig. 4. Since there is no intrinsic disease of the heart muscle, as in rheumatic and arteriosclerotic heart disease, the cardiac failure is reversible following the removal of the cause of the acute pulmonary insufficiency. These two patients offered an exceptional opportunity to illustrate the parallelism between the severity of pulmonary insufficiency and the degree of congestive heart failure.

SUMMARY

Two cases of chronic emphysema in which pulmonary infection resulted in acute congestive heart failure have been presented. The predominant lesion in one case was pneumonia, and in the second obstructive bronchitis. The sequence of events resulting in heart failure are discussed.

The technical assistance of Mrs. K. Galewski and Miss L. Beck is acknowledged with gratitude.

RESUMEN

Se presentan dos casos de enfisema crónico en los que la infección pulmonar trajo como consecuencia una insuficiencia congestivaaguda del corazón. La lesión predominante fué en un caso, neumonía, y en el otro, bronquitis obstructiva. Se discuten series de even—tos que condujeron a la insuficiencia cardiaca.

RESUME

Les auteurs rapportent deux cas d'emphysème chronique dans lesquels l'infection pulmonaire eut pour résultat une insuffisance cardiaque congestive aigue. La lésion prédominante était dans un cas une pneumonie, et dans le second une bronchite obstructive. Les auteurs étudient la succession des circonstances qui entrainent une insuffisance cardiaque.

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Acute, Transient Middle Lobe Disease

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The special significance of atelectasis of the middle lobe was first pointed out in 1946 by Zdansky[1] and Brock,[2] independently. Zdansky described two cases of middle lobe atelectasis in adults caused by compression of the middle lobe bronchus by a calcified lymph node. He noted that in children enlargement of a lymph node often causes compression of a major bronchus leading to atelectasis of the entire lobe without any predilection for any one bronchus and lobe. In adults, on the other hand, atelectasis of an entire lobe will occur more frequently in the middle lobe. In the other lobes, only the smaller bronchi will be compressed leading to segmental atelectasis. This can be explained by the fact that in children all the major bronchi are narrow and easily compressible, while of the major bronchi in adults only the middle lobe bronchus is narrow and is rendered even more easily compressible by virtue of the acute angle it forms with the main bronchus. He, therefore, called the right middle lobe "locus minoris resisteniae der Lunge." Zdansky also noted that besides cases of permanent atelectasis of the middle lobe one not uncommonly encounters a patient presenting an acute febrile illness in whom a chest film will reveal atelectasis of the middle lobe, which however, will reexpand after a few days with subsidence of symptoms. Not uncommonly one may find an enlarged lymph node near the origin of the bronchus. It is of interest to note here that Shaw,[3] in his excellent presentation of a "new clinical entity" caused by mucoid impaction of bronchi, reported 10 cases of segmental atelectasis, bronchiectasis and fibroid pneumonitis caused by plugs of mucus obstructing a bronchus of a second order in patients with asthma or chronic obstructive bronchitis. In one of these cases the middle lobe was involved. Brewer in his discussion of this paper reported a similar case.

Brock in "The Anatomy of the Bronchial Tree" also takes note of the frequency of the middle lobe collapse. He points out that the middle lobe bronchus is particularly vulnerable to the effects of glandular enlargement because it lies in the lymphatic pathway from the right lower lobe and is closely surrounded by glands which drain the lower and middle lobes. He mentions, however, that left upper and lower lobe bronchi are also liable to be compressed by the many glands which surround them at their origin.

The first one to coin the term "Middle Lobe Syndrome" was E. Graham[4] who in 1947 reported 12 cases of nontuberculous adults having compression of the middle lobe bronchus by enlarged lymph nodes. All were characterized clinically by hemoptysis and recurrent episodes of pulmonary infection. Atelectasis, fibrosis and bronchiectasis were the pathologic findings. The enlarged compressing lymph nodes showed changes of a chronic nonspecific lymphadenitis. He stressed the necessity of investigating all the lobes in each patient.

Paulson and Shaw[5] reported 32 adult patients, on 29 of whom lobectomy was performed. The pathological findings in the lung were the same as described by Graham. However, they found enlarged lymph nodes in only 15 of these cases. They postulate the possibility that the enlarged nodes may be secondary to the inflammation within the lobe. They noted that many of their patients gave a history of previous pneumonia. Duration of symptoms varied from five months to 20 years.

While in Graham's 12 cases and Paulson's 32 patients the disease was non-tuberculous, tuberculosis was considered as the underlying cause of the pathology in the 16 cases reported by Rubin[6] and in the eight patients of Cohen,[7] all of whom were adults. These workers based their diagnosis on the presence of calcified lymph nodes.

In all these reports as well as in the reports of Doig,[8] Brock,[9] Harper[10] and Fretheim[11] the cases were chronic. In this article the writer reports four cases of acute transient atelectasis of the middle lobe with or without acute pneumonitis all of which cleared up completely within one to four weeks.

Report of Cases

Case 1: H. M., a 52 year old male has had a chronic cough for many years with periodic exacerbations during which time sputum would become "thicker and hard to raise." When seen during one such episode in July 1944 (at the age of 44), the physical examination of his chest showed no abnormal findings. The breath sounds were normal. There was no wheezing and no rales were heard. The temperature was normal. Fluoroscopy of the chest and a posteroanterior film were negative. My diagnosis was chronic bronchitis and possible bronchiectasis. Further work-up was refused. The next time he was seen on May 5, 1952, he stated he got along fairly well with his usual symptoms of cough and occasional exacerbations. Lately he noticed increased expectoration but no other symptom. The physical examination was the same as eight years previously, viz. negative. Fluoroscopy in the posteroanterior view was essentially negative, except for suspicious shadowing near the right heart border. View in the lordotic position disclosed the characteristic triangular shadow of atelectasis of the middle lobe. Chest films (Fig. 5a and b) corroborated this. He was scheduled for bronchoscopy, but he delayed for one week. He returned May 12, 1952 and at that time fluoroscopy was negative in any positioning. Posteroanterior film taken June 16, 1952 (Fig. 5c) was negative. Cough and expectoration diminished gradually to the usual amount with fairly good general health.

Case 2: G. D., a 37 year old male was seen February 20, 1953 because of chills and fever five days previously followed by dry cough. On physical examination a few posttussive rales were heard in the right midaxilla. The temperature was normal. Fluoroscopy, posteroanterior and lateral films (Fig. 2a) revealed atelectasis of the middle lobe. He was put on antibiotic treatment. On his return 12 days later there were no rales in his chest and fluoroscopy showed considerable clearing of the shadow in the middle lobe. By March 14, 1953 the atelectasis disappeared completely as shown on the posteroanterior and lateral films (see Fig. 2b). He is well and working since then.

Case 3: T. H., a 38 year old female who was hospitalized November 27, 1951 because of fever of 103° F. of one week duration, and non-productive cough. Posteroanterior and lateral films on admission (Fig. 3a) showed evidence of atelectasis of the right middle lobe and pneumonitis in the middle lobe and possibly in the adjacent portion of the upper lobe. The following day the cough became productive and the temperature dropped to normal. Posteroanterior and lateral films taken four days later showed considerable clearing of the pneumonitis. Bronchoscopy was done December 10, 1951. The right middle lobe bronchus was found to be blocked by a plug of mucus. This was removed by suction. On December 20, 1951, a posteroanterior film (Fib. 3b) was negative except for a small area of infiltration in the right mediobase. She was discharged as improved. She failed to return for a re-check examination until March 5, 1952. A film taken on that day was entirely negative.

Case 4: M. P., a 47 year old male was first seen on March 3, 1953. He complained of severe productive cough of one month duration, fatigue and loss of 12 pounds of weight and sticking pains in his right chest. Posteroanterior and lateral films (Fig.

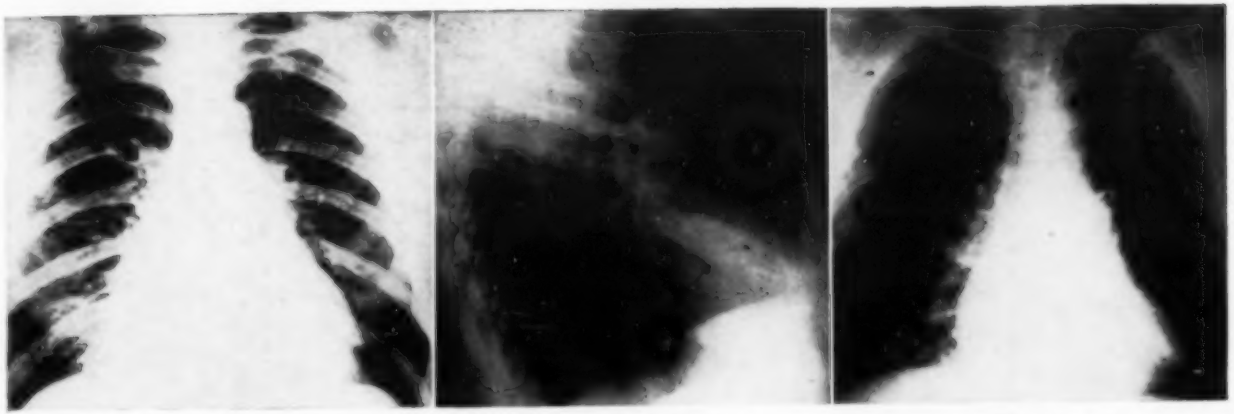

FIGURE 1A FIGURE 1B FIGURE 1C

Figure 1 CASE 1: (*a*) Posteroanterior film May 5, 1952 shows infiltration near the right cardiac border, which on the lateral film (*b*) proved to be atelectasis of the middle lobe (*c*) Posteroanterior film June 16, 1952 shows complete clearing of the infiltration.

4a) showed middle lobe atelectasis and pneumonitis. He was referred to a chest surgical clinic for further study. By the time he was given his first appointment in that clinic seven days later, March 10, 1953, a chest film disclosed considerable clearing of the consolidation and infiltration. By March 28, 1953 the chest film (Fig. 4b) was entirely negative. He became symptom-free and was discharged from the clinic.

Discussion

Bronchial occlusion leading to atelectasis of the corresponding lobe or segment may occur either by pressure from without, (e.g. by an enlarged lymph node or tumor), or by narrowing and obstruction from within, (e.g. by edema or fibrous stenosis of the wall or by a plug of mucus occluding the lumen).

A peculiar positioning of a bronchus may make it especially vulnerable to any of these causes of occlusion. Such is the case with the right middle lobe bronchus. It arises from the main stem bronchus at an acute angle and runs in close approximation with the anterior surface of the right lower lobe bronchus for a distance of about 0.75cm. before curving away from it in an anterior direction. This makes it more vulnerable to compression by the surrounding lymph nodes or to occlusion by a narrowing process within it. Moreover, this positioning may hinder adequate drainage from the inflamed lobe, leading to greater frequency of recurrence and chronicity of pneumonitis in this lobe. This greater frequency of occlusion of the right middle lobe bronchus as compared with the other major bronchi does not occur in children, because in a child all the major bronchi are of a narrow caliber and are easily compressible. Hence, lobar atelectasis in children occurs without any predilection for any one lobe. Such a situation exists also in adults in the case of the smaller secondary or tertiary bronchi; hence, segmental atelectasis in adults occurs with equal frequency in any lobe. It is only in the case of the major bronchi in the adult that a greater frequency of occlusion of the middle lobe bronchus occurs as compared with the other major bronchi. This greater frequency of involvement of the middle lobe justifies the term middle lobe syndrome, even though it may be of varying etiology and pathogenesis. Indeed, if the cases caused by active tuberculous lymphadenitis or bronchitis were to be excluded, one could consider this a disease entity of relatively frequent occurrence.

The name middle lobe syndrome is suggested as an all inclusive term for all cases of middle lobe atelectasis regardless of etiology, and the name middle lobe disease for all cases of atelectasis and pneumonitis which are not caused by active tuberculosis or by neoplasm. While conceivably some cases might have been caused originally by tuberculous lymphadenitis in childhood, the resultant pneumonitis later in life is non-specific and not distinguishable from pneumonitis caused by non-tuberculous lymph nodes or by mucus plugs and poor drainage. Middle lobe disease can thus be defined as characterized by atelectasis and pneumonitis of the middle lobe which may be either transient or chronic with or without accompanying bronchiectasis and caused by poor drainage from the middle lobe due to the peculiar positioning of the middle lobe bronchus.

In every case presenting a history of persistent or recurrent respiratory

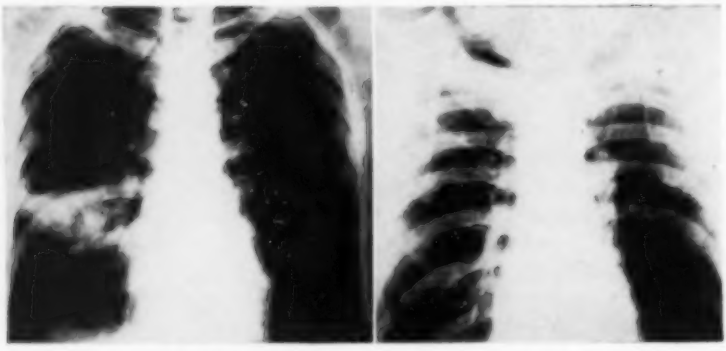

FIGURE 2A FIGURE 2B

Figure 2 CASE 2: (*a*) Film taken February 20, 1953 shows atelectasis and pneumonitis of the right middle lobe.—(*b*) March 14, 1953 complete resolution of the pneumonitis and disappearance of the atelectasis.

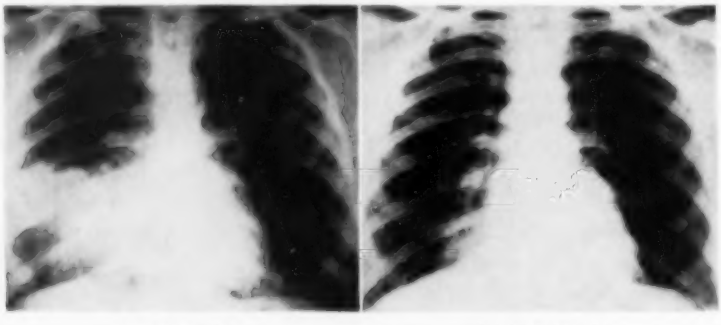

FIGURE 3A FIGURE 3B

Figure 3 CASE 3: (*a*) Film November 27, 1951 shows pneumonic infiltration in the entire right midlung field.—(*b*) Film December 20, 1951 shows only slight infiltration remaining in the right mediobase. (A film taken on March 5, 1952, not shown here, was entirely clear.)

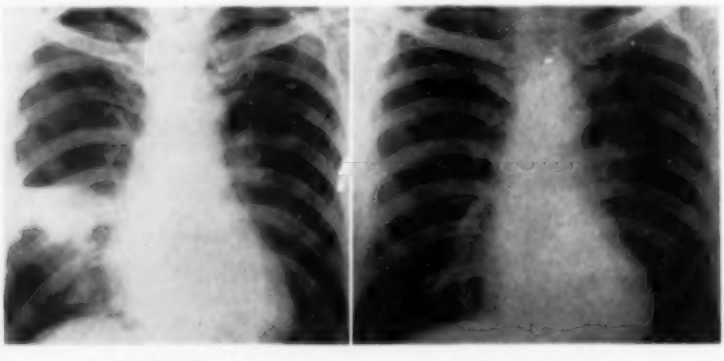

FIGURE 4A FIGURE 4B

Figure 4 CASE 4: (*a*) Film taken March 3, 1953 shows atelectasis and pneumonitis of the middle lobe.—(*b*) Film March 26, 1953, negative.

infection one should, among other diagnoses, entertain the possibility of middle lobe disease. On fluoroscopy of such a patient one should not depend on posteroanterior viewing alone. Quite often the shrunken middle lobe, lying in close proximity with the right heart border, may not be seen in that view—even a posteroanterior roentgenogram may fail to demonstrate it. It is, therefore, imperative also to fluoroscope in the lordotic position and take films in the lateral position.

Middle lobe disease should be differentiated from atelectasis caused by active tuberculous lymphadenitis or bronchitis and from that caused by bronchogenic carcinoma. The latter should be considered first in every case of atelectasis occurring in a middle-aged or elderly individual. However, in middle lobe atelectasis carcinoma is a less likely finding. Brock found that out of 1200 cases of bronchogenic carcinoma, only eight were in the middle lobe. Perhaps this is only a relative infrequency, due to the fact that atelectasis from various other causes is so much more frequent in the middle lobe.

Once the diagnosis of middle lobe disease has been established, one should make a thorough search for involvement in any of the other lobes. Bronchography should be done whenever feasible to rule out bronchiectasis in any other lobe, especially in cases of chronic pneumonitis considered for surgery. Bronchoscopy should be done in every case.

SUMMARY

1. Four cases of acute transient middle lobe disease have been presented.

2. The name middle lobe syndrome is suggested as an all inclusive term for all cases of middle lobe atelectasis regardless of etiology, and the name middle lobe disease for all those cases of atelectasis and pneumonitis which are not caused by active tuberculosis or by neoplasm.

3. Attention is being called to the fact that a considerable number of cases of middle lobe atelectasis may be of an acute and reversible nature. Due to the peculiar positioning of the middle lobe bronchus, drainage from an infected middle lobe is poor and mucus plug formation is frequent. As soon as the plug is expectorated or as soon as free drainage is reestablished, the lobe reexpands and a more favorable condition for the clearing of the pneumonitis is created. It is possible that chronic pneumonitis with or without atelectasis of the middle lobe (the latter may be obscured by the enlarged volume of the consolidated lobe) occurs as a result of failure of reestablishing free drainage. Bronchoscopy may be a therapeutic measure in some of these cases, in addition to being a diagnostic procedure.

4. Emphasis is placed on the importance of fluoroscopy in the lordotic position, since posteroanterior viewing may fail to demonstrate the shrunken middle lobe. A lateral film is of importance to establish the definite site of pneumonitis and atelectasis.

RESUMEN

1. Se han presentado cuatro casos de enfermedad aguda, transitoria del lóbulo medio.

2. Se sugiere el nombre de síndrome del lóbulo medio comotérmino que

incluye todos los casos de atelectasia del lóbulo mediosin tener en cuenta su etiología; y el nombre de enfermedad del lóbulo medio para todos los casos de atelectasia y de neumonitis que noson causados por tuberculosis o neoplasia.

3. Se llama la atención sobre el hecho de que an número considerable de casos de atelectasia del lóbulo medio, pueden ser agudos y reversibles. Debido a la peculiar posición del bronquio del lóbulo medio la canalización de ese lóbulo es deficiente y de ahí el taponamiento con masas mucosas. Tan pronto como el tapón es expectorado ocuando la canalización se restablece, se reexpande el lóbulo se crean condiciones favorables para la limpieza y curación de la neumonitis. Es posible que la neumonitis crónica con o sin atelectasia del lóbulo medio (siendo este susceptible de ser enmascarado por una área de consolidación má extensa) ocurra como resultado de la falta de restable cimiento de la canalización.

La broncoscopía puede ser un procedimiento terapéutico en algunos de estos casos, además de ser un método de diagnóstico.

4. Se hace énfasis sobre la importancia de la fluoroscopía en la posición de lordosis puesto que el aspecto anteroposterior, pue de dejar de mostrar el lóbulo medio retraído.

Una película lateral es de importancia para establecer conprecisión la ubicación de la numonitis y de la atelectasia.

RESUME

1. L'auteur rapporte quatre observations d'atteintes du lobe moyen réalisant une évolution aigue et passagère.

2. Il envisage d'utiliser le terme de "syndrome du lobe moyen" pour toutes les formes comportant une atélectasie de ce lobe, sans tenir compte de son étiologie. Il demande quie l'on désigne sous le nom de "maladies du lobe moyen" les atteintes atélectasiques ou pneumoniques, dont l'origine n'est ni la tuberculose évolutive, ni une néoplasie.

3. Il attire l'attention sur le fait qu'un nombre important d'atélectasies du lobe moyen peuvent être dues à un processus aigu et réversible. Etant donné la situation de la bronche lobaire moyenne, le drainage en cas d'infection du lobe moyen se fait mal; et il y a fréquemment constitution d'un bouchon de mucus. Des que ce bouchon est expectoré, ou des que le drainage est de nouveau établi, le lobe reprend son expansion et l'ombre pneumonique se trouve dans des conditions qui lui permettent de s'éclaircir. Il est possible que l'absence de rétablissement d'un drainage normal soit la cause de la pneumonie chronique. Celle-ci pouvant ou non s'accompagner d'atélectasie du lobe moyen (ce lobe peut être masqué par l'expansion du reste du poumon). Outre sa valeur diagnostique, la bronchoscopie peut avoir un intérêt thérapeutique dans certains de ces cas.

4. L'auteur insiste sur l'importance de la radioscopie en position lordotique, la position antéro-postérieure ne pouvant dans certains cas mettre en évidence l'atélectasie du lobe moyen. Un cliché de profil est de la plus grande importance pour montrer le siège véritable de la pneumonie ou de l'atélectasie.

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Chest X-ray Findings and Some Clinical Aspects in Pulmonary Paragonimiasis*

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Not less than 200 cases have been diagnosed as pulmonary paragonimiasis since 1947 at the medical department of the National Taiwan University Hospital. Of those, definite diagnosis by positive ova from the sputum accompanied by fairly complete laboratory examinations by means of chest x-ray films, blood sedimentation rate, tuberculin test, sputum examination, white blood count with differential and eosinophilia in pleural fluids or in spinal fluids, if necessary, were worked up in 100 cases. Some of these patients were well followed up for as long as three years. Sputa were negative for acid-fast bacilli in all cases by repeated simple smears or cultures.

I. *Chest X-ray Findings*

Few studies have been published on the x-ray findings of pulmonary paragonimiasis and none is sufficient to justify conclusions. Moreover there is no agreement among these studies. Bercovitz[1] reported that x-ray inspection of the lungs were disappointing and lipiodol installation showed no cavities. In a mass tuberculosis survey in Shinchu district, which is another endemic place of pulmonary paragonimiasis in Taiwan, Kusunoki et al[2] did not find any abnormality on miniature films of 98 persons in whom the parasite ova were discovered in the sputum. On the other hand, Ando and Yamada[3] reported from rice-sized to bean-sized nodular shadows on the x-ray film study of experimental animals, Wang and Hsih[4] described six cases of well-defined densities or isolated infiltrations which they thought to be characteristic for this condition. Yokogawa et al[5] also have called attention to the fact that they found circumscribed opacities in the majority of their nine cases.

In our series, we observed that the chest x-ray films of 88 out of 100 cases were more or less abnormal which will further be classified as follows.

1. *Well-defined Nodules*

In this category we include moderately or well-defined, considerably hard, but may be homogenously or irregular dense round or oval patches or nodules. We have seen this kind of nodules in 59 cases. Their sizes range from 0.5 to 4.0 cm. in diameter and may appear more than two in number on a single film (in 45 per cent) or combined with ill-defined opacities. The middle lung fields seem to be a slightly more favorite situation than the upper and lower fields (Table 2). These nodules are

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usually seen in chronic cases and do not disappear completely although they may change their size and density (Case 3).

Nodules are the most frequent manifestation among the abnormal findings in pulmonary paragonimiasis (Table 1). It is difficult to differentiate these nodules from those of tuberculosis on a single x-ray film. But on some occasions one may get a fairly strong impression that tuberculosis is not likely especially when they are multiple and connected with each other or situated in the lower lung field.

2. *Ill-defined or Hazy Opacities*

Ill-defined and soft hazy opacities, homogenous or irregular in their densities may be observed. They are usually 2 to 4 cm. or more in diameter, variable in shape and may be multiple in number. We observed this kind of shadow in 29 cases. This kind of shadow may appear at any stage of pulmonary paragonimiasis but especially in early newly discovered cases and they are liable to disappear (Case 1) or decrease in size with residual nodules remainings (Case 3) or reappear in other parts of the lungs by follow-up studies. These shadows are due to the perifocal unspecific inflammation or allergic reaction and are extremely difficult to differentiate from tuberculous infiltration as well as nonspecific bronchopneumonia by single x-ray film inspection. With clinical symptoms we might be able to predict the correct diagnosis even before the discovery of the parasite ova in some of these cases when the x-ray shadows resemble those of bronchopneumonia.

3. *Pleurisy*

Pleurisy with or without effusion was observed in 30 cases. Of these, 14 were on the right side, nine on the left and seven on both sides. It is most frequently seen in the early stage when the larva likely penetrate the diaphragm into the pleural spaces and consequently the ova still can not be found in the sputum. Pleurisy may also occur if the "burrow" is situated too near the visceral pleura or the parasites actually lodge in the pleural spaces. Differentiation from tuberculous pleurisy by x-ray film can not be made. However one's suspicion is aroused when it is bilateral and/or accompanied by hazy opacities in the lower lung field, which are uncommon in cases of tuberculous pleurisy.

4. *Spontaneous Pneumothorax*

We saw four cases with this condition. All were on the left side. Pleurisy with effusion and soft cloudy opacities in the lung parenchym were

TABLE I: ABNORMAL CHEST X-RAY FINDINGS IN 100 CASES OF PULMONARY PARAGONIMIASIS

Abnormal Findings	No. of Cases
Well-defined Nodules	59
Ill-defined Opacities	29
Pleurisy	30
Increases Lung Markings	34
Spontaneous Pneumothorax	4
Ring Shadows	2
Calcification	6

combined in all instances. These conditions disappeared in a short time (Case 4). Penetration of visceral pleura by the larva when they gain access into the lung is the most probable etiology.

In addition to the above mentioned, increased lung markings and calcified lesions were seen in 34 and six cases respectively. They were not pathognostic though. Ring shadows indicative of suspected cavitation were only seen in two cases. No case with definite cavitation has been seen.

TABLE II: LOCALIZATION OF ABNORMAL DENSITIES IN THE LUNG PARENCHYM

Localization	Right Upper	Right Middle	Right Lower	Left Upper	Left Middle	Left Lower
Nodules	14	26	21	17	17	11
Ill-defined Opa.	2	11	6	5	8	4
Calcifications	0	1	2	0	1	2
Total	16	38	29	22	26	17

II. *Some Other Clinical Aspects*

1. *Blood Sedimentation Rate*

Few references are available concerning this subject. One hour rate in 91 cases of our series at the first visit will be shown in Table 3.

TABLE III: BLOOD SEDIMENTATION RATE

BSR	Number of Cases	Mean Value
6—10	27	
11—20	25	
21—50	25	26.0
51—	14	
Total	91	

Blood sedimentation rate was variable and no definite correlation could be found with the type of x-ray shadow, severity of clinical symptoms and treatment. Because of its rather wide range, it is not too valuable in differential diagnosis.

2. *White Blood Count*

In 4 of our cases, there was leucocytosis of more than 10,000 in 26 cases (58 per cent) with the mean value of 12,000. Leucocytosis is apt to subside following treatment but no relationship could be found between leucocytosis and the extent of the x-ray findings or the clinical symptoms at the first consultation. The differential count was within normal limits except the esosinophils which was often markedly increased.

3. *Eosinophilia*

It is generally believed that there is slight eosinophilia in the peripheral blood, but Bercovitz[1] reported the value of one per cent eosinophil from his 20 cases. We obtained an average of 13.6 per cent in 45 cases.

Eosinophils constituted more than 50 per cent of the white cells in

pleural fluid in 8 of our 10 cases who had such blood studies. This finding might be the only way to differentiate from tuberculous pleurisy with effusion in many instances at the time when the diagnosis is still obscure due to the negative result of parasite ova in the sputum.

More than 60 per cent eosinophilia with increase of cell count in the spinal fluid were obtained in two cases of cerebral manifestation. This finding is suggestive of cerebral manifestation of this malady and may be the key point to differentiate from other cerebral conditions.

4. *Subcutaneous creeping tumors*

In nine of 100 cases subcutaneous tumors were found. These were from green-pea to thumbtip in size and fairly firm in consistency. The subcutaneous connective tissue of the abdominal or the chest wall were the most frequent situations. Characteristic is that they may creep from one place to another and may disappear or reappear. The tumor may be single or multiple in number.

Case 1: S. T. C., a 43 year old male, visited our out patient department on June 19, 1948 with the complaints of cough, and chest pain for about one month and bloody sputum for two days. No fever elevation was noticed. He had a history of eating undercooked crabs two months prior. Physical examination showed the signs of bilateral pleural effusion which was proved by aspiration. This was a serous exudate but negative for

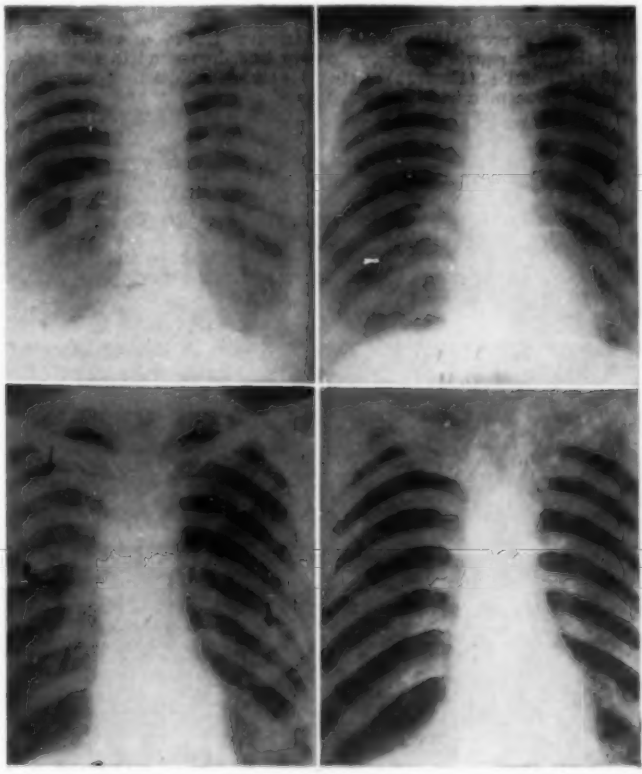

FIGURE 1A

FIGURE 1B

FIGURE 2A

FIGURE 2B

acid-fast bacilli both by smear and culture. Worthwhile is that eosinophilic leucocytes constitute more than 80 per cent of the cell elements of the effusion. There were 10,100 white blood cells with differential of 16 per cent eosinophils. Blood sedimentation rate was 52 (one hour). Chest x-ray film showed evidence of bilateral pleural effusion with an ill-defined density in the left middle lung field (Fig. 1A). Repeated sputum examination for acid-fast bacilli and ova of paragonimus westermanii had been negative until July 27, when the latter were found in the bloody sputum. Chest x-ray film on August 29 revealed clearing of the pleural effusion bilaterally and condensation of the previous cloudy opacity in the left middle lung field (Fig. 1B).

Case 2: C. S. C., a 26-year-old male, was admitted in August 1948, complaining of severe cough and bloody sputum for two weeks. He had taken raw crabs in several occasions since 1946. In August 1947 he suffered from chest pain with bloody sputum, thereafter he had recurrent hemoptysis and had been treated as pulmonary tuberculosis. Once, he noticed a finger tip sized tumor in the abdominal wall but not much attention was paid because it disappeared in a few days. Physical examination on admission revealed no abnormal physical sign in the chest or the abdomen. The tuberculin test was positive, the blood sedimentation rate was 43 (1 hour). No fever was noted. There was no abnormal finding in his blood count except 8 per cent eosinophilia. A chest x-ray film taken on August 7 (Fig. 2A) revealed an ill-defined opacity, Irregular in its homogenity, throughout the right upper lung field, resembling that of tuberculous infiltration. Well defined nodules also were evident in the left lower lung field. Ova of distoma were found from the sputum but acid-fast bacilli were not demonstrated by 70 smears and 20 cultures. Following the combined therapy of emetine and aktisol, his symptoms were greatly improved although the ova did not disappear completely. A chest x-ray film on September 24 showed almost complete clearing of the abnormal density in the right upper lobe (Fig. 2B). He was discharged on December 11.

Case 3: K. S. C., a medical student, aged 27, was found to have an ill-defined cloudy opacity in the right middle lung field mesially in December 1949 (Fig. 3A). In the summer of that year, he recalled eating undercooked crabs followed by chocolate-colored sputum in which the ova of paragonimus westermanii were found by himself. Sputa were negative both by smear and culture. White blood count and red blood sedimentation rate were within normal limits. On January 12, 1950 a follow-up x-ray film study revealed that the previous cloudy density had decreased in size and appeared to be a well defined nodule (Fig. 3b). He is now a resident of our hospital and a follow-up study in December 1951 showed further minimization of the nodule.

Case 4: C. W. S., a male, aged 34, visited our outpatient department on January 21, 1948 with the complaints of chest pain and intense cough. A chest x-ray film taken nine days prior was normal. In view of reduced resonance with diminished breath sound over the left lower chest, another film was ordered on January 30, which showed left spontaneous pneumothorax with pleural effusion and a soft density in the left midlung field (Fig. 4A). The fluid was yellowish clear, positive for Rivalta test and negative for acid-fast bacilli by culture. Left pulmonary tuberculosis with spontaneous seropneumothorax had been the diagnosis until white blood count was done a few days later with the result of 14,900 leucocytes and 16 per cent eosinophilia. The

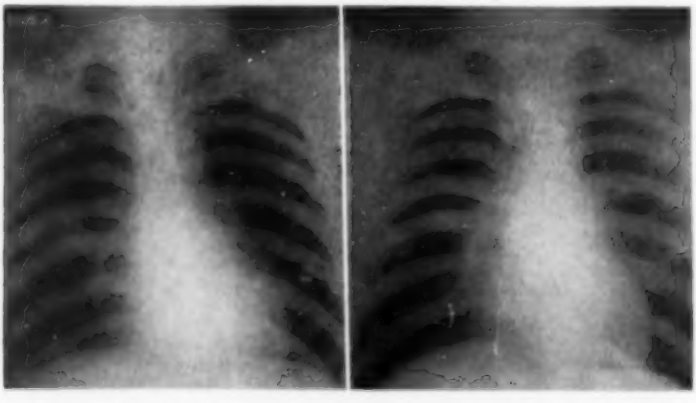

FIGURE 3A FIGURE 3B

follow-up roentgenological examination on February 16 revealed complete clearing of the seropneumothorax as well as the parenchymal infiltration (Fig. 4B). Thereafter he developed right sided pleurisy with effusion (eosinophilia in it) in March and finally was admitted to the medical ward on May 1, for a complete work up of his disease. During his hospitalization, eosinophilia in peripheral blood ranged from 28 to 55 per cent. Acid-fast bacilli were not demonstrated by 50 smears and 15 cultures. A diagnosis of pulmonary paragonimiasis had only been suspected until the discovery of the parasite ova in bloody sputum on September 21.

SUMMARY AND CONCLUSION

1. Chest x-ray films and some other clinical figures have been studied in 100 cases of proved pulmonary paragonimiasis.

2. Contrary to the previous general belief, x-ray findings of pulmonary paragonimiasis may reveal one or several kinds of abnormalities; namely well-defined nodules, ill-defined transient opacities, pleurisy, spontaneous pneumothorax and ring shadows, provided they are well followed up from the onset of disease.

3. It is difficult to differentiate these abnormalities from those of tuberculosis or bronchopneumonia by x-ray films alone with some exceptional cases in which the impression from the findings as a whole is definitely unlike that of tuberculosis.

4. The incidence of pleurisy with or without effusion is high and it is often the first manifestation. High percentage of eosinophils in the pleural effusion has its diagnostic value to differentiate from tuberculous pleurisy.

5. Slight leucocytosis with differential count of considerable eosinophilia in peripheral blood are rather common.

6. The mean value of blood sedimentation rate in this disease is slightly increased. It has a such a wide range it is not valuable in diagnosis.

7. Eosinophilia in the cerebrospinal fluid may be the key point to differentiate the cerebral complication of this disease from other cerebral conditions.

8. Subcutaneous creeping tumors, if present, are strongly suggestive of this disease in Taiwan.

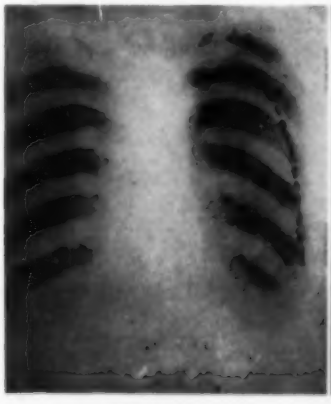

FIGURE 4A

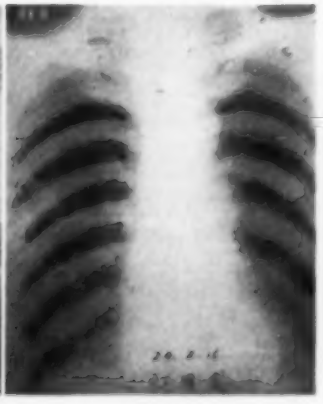

FIGURE 4B

RESUMEN

1. Se han estudiado las películas roentgenograficas y otros aspectos clínicos en 100 casos de paragonimiasis demostrada en el pulmón.

2. Contrariamente a la creencia general, los hallazgos a los rayos X en la paragonimiasis pulmonar, pueden revelar varias clases de anormalidades; como son nódulos bien definidos, opacidades transitorias mal definidas, pleuresía, neumotórax-espontáneos e imágenes anulares, siempre que se busquen desde el principio de la enfermedad.

3. Es difícil diferenciar estas anormalidades de las de la bronoconeumonía o de la tuberculosis sólo por los rayos X, salvo algunos casos en los que la impresión de los hallazgos, es definidamente disimilar de la tuberculosis.

4. La frecuencia de la pleuresia con o sin derrame, esalta y a menudo es la primera manifestación. Un elevado porcentaje de eosinófilos en el líquido pleural, tiene valor diagnóstico para diferenciar de la pleuresía tuberculosa.

5. Es común encontrar ligera leucocitosis con una cuenta diferencial mostrando considerable eosinofília en la sangre periférica.

6. La sedimentación globular está ligeramente aumentada.

7. La eosinofilia en el líquido cerebroespinal, puede dar la clave para diferenciar la complicación cerebral de esta enfermedad, de otras afecciones cerebrales.

8. Los tumores subcutáneos movedizos, cuando se encuentran, son fuertemente sugestivos de esta enfermedad en Taiwan.

RESUME

1. Les auteurs ont étudié les radiographies pulmonaires et quelques caractères cliniques concernant cent cas de distomatose pulmonaire avérée.

2. A l'opposé de l'opinion généralment admise jusqu'à présent, les constatations radiologiques dans la distomatose pulmonaire peuvent mettre en é vidence un ou plusieurs caractères anormaux; nodules bien délimités, infiltrats labiles, pleurésie, pneumothorax spontané, et ombres annulaires. es altérations apparaissent à condition que la maladie soit suivie depuis son extrême début.

3. Dans l'ensemble, on ne peut que difficilement différencier ces aspects radiologiques de ceux qui appartiennent habituellement à une tuberculose ou aux pneumopathies aigues. Ce n'est que dans quelques cas exceptionnels que l'aspect apparait nettement différent de celui de la tuberculose.

4. Une réaction pleurale avec ou sans épanchement est fréquente et réalise souvent la première manifestation de la maladie. L'importance de l'éosinophilie du liquide pleural a une grande valeur diagnostique et permet de le différencier de celui de la pleurésie tuberculeuse.

5. Dans le sang périphérique, l'existence d'une leucocytose peu élevée avec une éosinophilie considérable est assez commune.

6. La vitesse de sédimentation sanguine est, dans cette affection, légère-

ment augmentée. Toutéfois, cette augmentation n'atteint pas de proportions suffisantes pour prendre une valeur au point de vue du diagnostic.

7. L'existence d'éosinophilie dans le liquide céphalo-rachidien peut permettre de différencier les complications cérébrales d'autres affections touchant l'encéphale.

8. L'existence de tumeurs sous-cutanées mobiles, si on peut les constater, est tout à fait suggestive de cette affection.

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Teaching Chest Disease*
The Chest X-ray Survey as a Teaching Instrument

THEODORE H. NOEHREN, M.D., F.C.C.P.**
Buffalo, New York

Chest x-ray surveys have proved themselves of considerable value in discovering chest disease. They also contain great teaching possibilities which have received scant attention. In one city the survey was used to demonstrate three significant teaching aspects.

In this survey all individuals who had abnormalities discovered on photofluorograms and confirmed with standard roentgenograms were asked to report to a diagnostic clinic. Medical students acted as physicians in this clinic. Here a short history was taken by them for the control records, and sputum and skin test procedures initiated. The patients were shown their roentgenograms which were explained to them by the medical students under the guidance of a senior consultant. This interview served to impress upon the patient the importance of seeing his or her private physician, and following through to thorough understanding and treatment, if indicated, of the roentgen findings. These interviews also introduced the medical students to more new chest pathology, and allowed them to examine more patients with a variety of pulmonary disease in a shorter period of time, than is possible in any other way. They could not help but be stimulated to realize the significance of chest diseases.

A second teaching demonstration by the survey was the revelation to the students and practicing physicians of the amount of thoracic pathology that can be overlooked without roentgen examination. Many of the patients in whom disease was discovered had recently had a "complete examination," but without roentgenologic study of their chests and had been assured they were in good health. The findings of the survey taught an embarrassing lesson to many physicians and students who had been unaware of the great value of routine chest roentgenograms. Unfortunately, this lesson is still to be revealed to many more physicians.

The third educational value of this survey was the accumulation of teaching material for later demonstration of the value of routine chest roentgen examination. We were able to assemble a series of over 90 survey cases, each representing different thoracic abnormalities. This included many of the "normal" variations of chest structure, agenesis of the lung, various effusions, histoplasmosis, coccidiodomycosis, forms of pulmonary tuberculosis and its treatment, silicosis, varieties of cystic disease, "coin" lesions of different etiologies, numerous tumors, malignant and benign, esophageal diseases, sarcoidosis, diaphragmatic abnormalities,

*The first in a new series of articles prepared under the sponsorship of the Council on Undergraduate Education of the American College of Chest Physicians.

**Assistant Professor of Medicine, University of Buffalo School of Medicine and Department of Medicine, Buffalo General Hospital.

rib tumors, aneurysms, and a variety of cardiac changes including septal defects, situs inversus, vascular rings, coarctation and the many variations of rheumatic and hypertensive heart disease. In fact, the variety was complete enough to organize the films in such fashion that there was a case to represent nearly all the entities listed in Rubin's *Diseases of the Chest*. It has been presented in that order and entitled "Everything in the Book."

The demonstration of these cases has been especially impressive when one realizes that these were all individuals walking on the streets of an average-sized American city. A similar series can easily be assembled by any routine x-ray unit or center. Presentation of these cases on slides has been enthusiastically received and has initiated plans for routine admission roentgenograms in several institutions.

RECIPIENT OF COLLEGE MEDAL

Raul F. Vaccarezza, M.D., F.C.C.P.
Buenos Aires, Argentina

Presentation of the College Medal to Dr. Raul F. Vaccarezza*

Mr. Chairman, Your Excellencies, Distinguished Officials of the College, Ladies and Gentlemen:

As Chairman of the Council on International Affairs of the American College of Chest Physicians, it gives me great pleasure to expedite the awarding of the Medal for outstanding scientific achievement in the specialty of diseases of the chest.

This Medal is offered by the College, an international organization, in recognition of exceptional, genuinely original, important work in this field, every two years at the time of the International Chest Congress. We feel gratified to report to this distinguished gathering that after due circumspection and deliberation, selection of a man has been made for this honor.

His talent and ability, we are sure, amply deserve this decision. He has been a teacher and educator of medical students for many years. His name as a clinician is well known far beyond the confines of his own community and far beyond the boundaries of his country.

Though both of these accomplishments are laudable and admirable, this reward is extended to him because of his renowned research work. Through ingenious foresight, he explored the secrets of the functional capacity of the lung. His endeavors in this direction began many years ago. He approached the problem with the inquisitiveness of a pioneer and the objective perspective of a true scientist. He covered hitherto unexplored territory with the intuition of an artist, with the courage of a good soldier and with the meticulous precision of famous artisans. Through his extensive, indefatigable, investigative studies, new means and methods for measuring pulmonary function have crystallized.

The crudeness and uncertainty of earlier empirical methods have been replaced by his scientific endeavors by exactness and precision. His contributions in this respect represent immeasurably valuable tools for everyday use in thoracic surgery, diagnosis and medical management of chest diseases as well as in forensic medicine.

His profound knowledge, his analytical insight and mature prudence have brought him to the forefront of medical activities. Consequently, his affiliations included editorship of medical journals, governorship in the American College of Chest Physicians, presidency of his national chapter and a great many other distinctions. He is a prolific medical writer and the author of more than 250 scientific papers. At the present time he is Professor of Pathology and Clinical Tuberculosis at the Medical School of the University of Buenos Aires, Argentina. Also, he is Director of the Institute of Phthisiology at the same University.

Ladies and gentlemen, awarding this Medal is symbolic of the respect and admiration of the membership of this great international organization, the American College of Chest Physicians. To me personally, it is a distinct privilege indeed, to give you the Medal of the American College of Chest Physicians, Professor Raul F. Vaccarezza.

ANDREW L. BANYAI, M.D., F.C.C.P.
Milwaukee, Wisconsin

*Presented at the Inaugural Ceremony, Third International Congress on Diseases of the Chest, Barcelona, Spain, October 4, 1954.

THIRD INTERNATIONAL CONGRESS ON DISEASES OF THE CHEST
Barcelona, Spain, October 4-8, 1954

Some of the delegates of the Congress photographed at the entrance to the National Palace of Montjuich, Barcelona, where the sessions of the Congress were held.

Third International Congress on Diseases of the Chest

More than two thousand delegates and their wives, representing fifty-nine countries throughout the world, attended the Third International Congress on Diseases of the Chest held in Barcelona, Spain, October 4-8, 1954. The Congress was sponsored by the Council on International Affairs of the American College of Chest Physicians and presented under the Patronage of the Spanish Government. Its Honorary Presidency was graciously accepted by the Honorable Generalissimo Francisco Franco, Chief of State of the Spanish Government. The officers of the Congress were: Dr. Luis Rosal, Barcelona, Spain, President; Dr. Cristobal Martinez Bordiu, the Marquis de Villaverde, Madrid, Spain, Vice President; Dr. Antonio Caralps, Barcelona, Spain, Secretary General; and Dr. Francisco Coll Colome, Barcelona, Spain, Treasurer. Other officials of the Spanish Government who served in an honorary capacity for the Congress were the following: Hon. Blas Perez Gonzalez, Minister of State; Hon. Joaquin Ruiz Gimenez, Minister of Education; Hon. Alberto Martin Artajo, Minister of the Exterior; and Hon. Gabriel Arias Salgado y de Cubas, Minister of Information and Tourism. The Directors of all Government Services of Spain, the medical schools and medical associations, as well as the ambassadors and consuls represented in Spain, also served as Honorary Members of the Congress.

The solemn Inaugural Ceremony and the scientific meetings were held at the magnificent National Palace of Montjuich. This splendid structure, built in 1929 for an international exposition, stands in a beautiful park on one of the mountains which surround Barcelona. It affords a superb, panoramic view of the city. On the opening night its richly illuminated facade, its flower-decorated and flag-bedecked halls gleamed with the radiance of a crystal castle of fairy tales.

The ceremonies of the inaugural session took place in the immense general assembly hall. Representatives of the Government of Spain, dignitaries of the Provincial Government and the Municipality of Barcelona, Ministry of Health and other prominent functionaries of governmental agencies and the Royal Academy of Medicine and Deans of Medical Schools added emphasis to the importance of the occasion. A large contingent of the Board of Regents and Board of Governors of the College was present.

Nothing could have been more expressive of the unity of purpose of all those present than the melodious chords of the national anthems of the various countries. The resounding tones of the huge organ signalized the opening of the Congress. The high-lights of the evening began with the introductory oration delivered by Dr. Rosal, President of the Congress. Following this, President Eisenhower's message to the Congress was read by Dr. Alvis E. Greer, Houston, Texas, Immediate Past President of the College. Fellowship certificates were given to a large number of chest specialists from Argentina, Australia, Austria, Belgium, Brazil, Colombia, Cuba, Finland, France, Germany, Great Britain, Greece, India, Israel, Italy, Japan, Lebanon, The Netherlands, Philippine Islands, Portugal, Spain, Sweden, Switzerland, Turkey, Venezuela and the Union of South Africa.

The International Award of the College Medal for outstanding scientific contribution was given to Dr. Raul F. Vaccarezza, Professor of Pathology and Clinical Tuberculosis at the Medical School of Buenos Aires, Argentina.

The next speaker was Dr. William A. Hudson, Detroit, Michigan, President of the College, who on behalf of the officers and membership, conveyed his thanks and grateful appreciation. A most hearty welcome was extended to the Congress by the Mayor of Barcelona, Senor Simarro. Finally, the Civil Governor, Senor Felipe Acedo Colunga, representing the Spanish Government as well as on his own behalf, greeted the participants and declared the Congress open. Following the formal Inaugural Ceremony, a reception was given in the beautiful marble rotunda on the second floor of the National Palace.

SPANISH DIGNITARIES AT INAUGURAL CEREMONY

Inaugural Ceremony, Third International Congress on Diseases of the Chest. The Civil Governor of the Province, the Mayor of Barcelona, and other Spanish Dignitaries were seated at the above table of honor.

COLLEGE OFFICIALS AT INAUGURAL CEREMONY

Left to right: Dr. Joachim Hein, Germany; Dr. Gumersindo Sayago, Argentina; Dr. Donato G. Alarcon, Mexico; Dr. James H. Stygall, U.S.A.; Dr. Etienne Bernard, France; Dr. Alvis E. Greer, U.S.A.

Left to right: Dr. Antonio Crespo Alvarez, Spain; Dr. Eugenio Morelli, Italy; Dr. Antonio Caralps, Spain; Dr. William A. Hudson, U.S.A.; Dr. Luis Rosal, Spain; Dr. Raul F. Vaccarezza, Argentina.

Left to right: Dr. Raul F. Vaccarezza, Argentina; Dr. Andrew L. Banyai, U.S.A.; Dr. Manoel de Abreu, Brazil; Dr. Lopo de Carvalho, Portugal; Dr. Donald R. McKay, U.S.A.; Dr. P. E. A. Nylander, Finland; Dr. Burgess L. Gordon, U.S.A.; Mr. Murray Kornfeld, U.S.A.

PRESIDENT HUDSON ADDRESSES CONGRESS

Dr. William A. Hudson, Detroit, Michigan, President of the American College of Chest Physicians, addressing the Inaugural Ceremony. At extreme right, Dr. Luis Rosal, President of the Congress.

Dr. Alvis E. Greer, Houston, Texas, Immediate Past President of the College, reading the message received from President Dwight D. Eisenhower at the Inaugural Ceremony.

DR. VACCAREZZA RECEIVES COLLEGE MEDAL

Dr. Raul F. Vaccarezza, Buenos Aires, Argentina, being introduced by Dr. Andrew L. Banyai, Milwaukee, Wisconsin, Chairman of the Council on International Affairs, when he was awarded the College Medal at the Inaugural Ceremony. At extreme left, Dr. Luis Rosal, Barcelona, President of the Congress. At extreme right, Dr. Manoel de Abreu, Rio de Janeiro, Brazil, President of the Second International Congress held in Rio de Janeiro in 1952 and recipient of the College Medal in 1950.

For the convenience of the members of the Congress, postal, telephone, telegraphic, banking, travel and information services, as well as free secretarial assistance were available. Excellent transportation facilities from the hotels to the Palace were provided by the local arrangements committee.

The most popular part of the program were the panel discussions of tuberculosis, tumors of the chest, asthma and emphysema and cardiovascular diseases. The four subjects were presented in the main assembly hall on four consecutive days. Members of these panels, seated at the long speakers' table, were a veritable galaxy of luminaries of medical science. With the help of interpreters and the use of earphones, it was possible to listen to questions and answers simultaneously in five different languages, namely, Spanish, French, German, Italian and English.

Recent advances in the diagnosis, medical and surgical treatment of chest diseases were illustrated in a large number of scientific motion pictures.

More than 250 papers and lectures were presented in five lecture halls. A printed program of 874 pages containing abstracts of these papers translated into the five official languages was presented to each physician regis-

MURRAY KORNFELD RECEIVES CERTIFICATE

Dr. Luis Rosal, President of the Congress, presenting Mr. Murray Kornfeld with a special certificate of appreciation from the Barcelona Chapter of the College. Seated in foreground, Dr. Burgess L. Gordon, U.S.A., Second Vice President of the College.

tered for the Congress. The scientific papers encompassed carcinoma and other tumors of the lung, pulmonary infections, parasitic infestations, bronchial asthma, emphysema, cystic disease of the lung, Loeffler's syndrome, foreign bodies, oil granuloma, fibrosis, pneumonoconiosis, atelectasis, bronchiectasis, surgery of the thoracic duct and bronchi, diseases of the pleura, diaphragm, mediastinum and esophagus. Several speakers discussed subjects covering cardiovascular diseases. Considerable time was devoted to diagnostic procedures, such as cytology, pneumomediastinum, pneumoangiography, vertical tomograms and others. Experimental and clinical aspects of cardiopulmonary function tests were adequately dealt with.

Moreover, the program included scientific curiosities, such as congenital absence of the hemidiaphragm, retrosternal diaphragmatic hernia, diaphragmatic hernia containing the liver and spleen, a new syndrome called alveolar-capillary block, a new type of pneumonoconiosis designated as suberosis (attributable to cork dust), primary melanoma of the mediastinum, simultaneous bilateral spontaneous pneumothorax, essential pulmonary hemosiderosis, agenesis of one lung, Tietze's syndrome, psychogenic pulmonary hemorrhage, bronchopulmonary ossification, regional bronchitis, echinococcus involvement of the myocardium, eosinophilic infiltration of the epididymis, prostate, kidney and muscles in Loeffler's syndrome, the so-called pharyngo-epiglottic syndrome and disappearing giant pulmonary bullae.

Our Spanish hosts were most generous and considerate in entertaining members of the Congress. Senor Simarro, the Mayor of Barcelona, arranged a splendid reception at the "Pueblo Espanol" where the delegates, their wives and guests, were treated to a presentation of typical Spanish dances with the performers dressed in ancient costumes of deep, vivid colors. The high-light of the dancing program was the presentation of "Carmen" by a group of outstanding Spanish dancers which was given in the second portion of the program following a lavish buffet supper.

The splendid social program included a "Bull Fight Fiesta" to which all of the members of the Congress and their guests were invited. In addition, receptions were offered by the officials of the Town Hall and by the deputies for

DR. LOEFFLER RECEIVES HONORARY FELLOWSHIP

Dr. Wilhelm Loeffler, Zurich, Switzerland (right), receiving certificate of Honorary Fellowship in the College from the President, Dr. Hudson. At extreme right, Dr. Arthur M. Olsen, Rochester, Governor of the College for Minnesota.

the Province. There were also sightseeing tours of the city including a visit to the old Gothic Quarter and to the Mares Museum.

The Congress was closed with a festive banquet given in honor of the participants. It was a spirited, gala event of exquisite elegance, marvelous splendor and unforgettable beauty. Those who sauntered to the spacious balconies of the palace were enchanted by the sight of a huge, running, illuminated fountain below. Its multicolored streams changed their pattern as well as their hue every few minutes, gracefully swaying, pirouetting in lilting curves, embracing and unfolding arches, like a delightful tropical flower or the gorgeous plumes of a giant peacock.

Spectacular as this sight was, it dwarfed next to the intangible values represented by the scientific contributions brought together at this Congress. They were concrete facts from the retorts of great minds, seasoned with the essence of intellect, wisdom and wit.

In view of all this, I am certain the entire membership of the College owes endless thanks and gratitude to our Spanish colleagues, particularly to Drs. Rosal and Caralps, the Marquis de Villaverde, Dr. Coll and to all others concerned, for their charming, congenial hospitality and for making this Congress possible.

The narrative of the Congress would not be complete without relating the distinction extended to Murray Kornfeld, Executive Director of the College. In recognition of his faithful, untiring devotion and invaluable services to this organization, he was awarded testimonial plaques of merit by the Spanish, German, Greek, Italian and Portuguese Chapters at the Inaugural Ceremony.

SCIENTIFIC SESSIONS

The use of earphones for simultaneous translation at the scientific sessions of the Third International Congress on Diseases of the Chest.

The Third International Congress on Diseases of the Chest is recorded by this reporter as a memorable tribute to the men whose ability and talent have been guiding the phenomenal growth of this scientific society. May its tremendous success serve forever as an inspiration for still greater achievements.

ANDREW L. BANYAI, M.D., F.C.C.P., Chairman
Council on International Affairs

Executive Sessions

The Council on International Affairs of the College held two executive sessions during the Third International Congress on Diseases of the Chest. The Inaugural Executive Session, attended by 107 officials of the College, was held on Monday afternoon, October 4, at the Avenida Palace Hotel, Barcelona. Dr. William A. Hudson, President of the College, presided at the session and introduced Dr. Luis Rosal, President of the Congress, and Dr. Antonio Caralps, the Secretary General, who addressed the assembled delegates briefly.

The following reports were presented:

Council on International Affairs
Andrew L. Banyai, Milwaukee, Wisconsin, U.S.A., Chairman

Council on Pan American Affairs
North and Central America: John F. Briggs, St. Paul, Minnesota, U.S.A.
South America: Gumersindo Sayago, Cordoba, Argentina

Council on European Affairs
Attilio Omodei Zorini, Rome, Italy, Chairman

Council on Pan Pacific Affairs
Manuel Quisumbing, Manila, Philippine Islands

Council on African and Eastern Affairs
David P. Marais, Cape Town, South Africa, Chairman

Committee on Membership
Chevalier L. Jackson, Philadelphia, Pennsylvania, U.S.A., Chairman

Board of Examiners
Harold G. Trimble, Oakland, California, U.S.A., Chairman

Committee on College Essay Awards
Richard R. Trail, London, England

Committee on Resident Fellowships
Alfred A. Richman, New York, N. Y., U.S.A., Chairman

Committee on Motion Pictures
Alfred Goldman, Los Angeles, California, U.S.A.

The reports were received with great interest and discussion followed concerning future activities of the College.

The Closing Executive Session was held on the afternoon of Friday, October 8, at the Avenida Palace Hotel. Dr. Hudson, President, presided. Dr. Antonio Caralps presented the report of the Secretary General of the Congress and expressed the hope of their executive committee that the delegates were pleased with the arrangements of the Third International Congress, now nearing its close. Dr. Hudson extended the profound gratitude of the officers and members of the College to Dr. Rosal, Dr. Caralps and the members of the organizing committee for their splendid work in arranging and conducting this great Congress. Mr. Murray Kornfeld, the Executive Director of the College, expressed his appreciation for the Certificates of Merit presented to him by the Spanish, German, Greek, Italian and Portuguese Chapters of the College.

A resolution was adopted at the Closing Executive Session of the Congress extending the appreciation of the American College of Chest Physicians to Generalissimo Francisco Franco Bahamonde and to all of the officials of the Government of Spain, as well as to the officials of the city of Barcelona and the Province, for their support of the Third International Congress on Diseases of the Chest. Through their cooperation and assistance important scientists from all parts of the world were brought together in Barcelona for the purpose of discussing the most recent developments in the specialty of diseases of the chest. A special vote of thanks was given to Mrs. Maluquer-Wahl, Mr. Garcia and their assistants, for the excellent manner in which the many details connected with the Secretariat were handled. A vote of appreciation was extended to the scientific and technical exhibitors and special awards were presented to the technical exhibitors for their splendid support of the Congress.

Dr. Andrew L. Banyai, Chairman of the Council on International Affairs, announced that invitations had been received from six countries for the Fourth International Congress on Diseases of the Chest to be held in 1956. Invitations were received from Austria, Canada, Colombia, Germany, India and the United States of America. The Executive Council of the College, after careful deliberation, accepted the invitation received from the German Republic. Dr. Banyai further announced that the city in which the Congress would be held in 1956 had not yet been selected, but that it had been arranged for the Executive Director of the College to travel to Germany immediately following the close of the Congress in Barcelona, in order to inspect the facilities of the various cities. Dr. Joachim Hein, Schleswig-Holstein, Regent of the College for Germany, expressed for the German members their pleasure in being selected host for the next International Congress.

The Committee on Nominations, under the chairmanship of Dr. Burgess L. Gordon, U.S.A., presented the following slate of officers for election:

INAUGURAL EXECUTIVE SESSION

Some of the Officials of the College in attendance at the Inaugural Executive Session, Monday, October 4, 1954, Avenida Palace Hotel, Barcelona, Spain.

Regents

Honorary Regents		
Brazil	Affonso MacDowell	Rio de Janeiro
Canada	William E. Ogden	Toronto
Italy	Eugenio Morelli	Rome
Switzerland	Gustav Maurer	Zurich
Regents		
Argentina	Gumersindo Sayago	Cordoba
Australia	W. Cotter Harvey	Sydney
Belgium	Lucien Brull	Liege
Brazil	Manoel de Abreu	Rio de Janeiro
Canada	Harold I. Kinsey	Toronto
Central America	Amadeo Vicente Mastellari	Panama City
Chile	Hector Orrego Puelma	Santiago
Colombia	Carlos Arboleda Diaz	Bogota
Cuba	Antonio Navarrete	Havana
Ecuador	Juan Tanca Marengo	Guayaquil
France	Etienne Bernard	Paris
Germany	Joachim Hein	Schleswig-Holstein
Great Britain	Alexander Fleming	London
Greece	Nicholas Oekonomopolous	Athens
India	Raman Viswanathan	New Delhi
Italy	A. Omodei Zorini	Rome
Japan	Jo Ono	Tokyo
Mexico	Donato G. Alarcon	Mexico City
Netherlands	L. D. Eerland	Groningen
Peru	Ovidio Garcia-Rosell	Lima
Philippine Islands	Miguel Canizares	Manila
Portugal	Lopo de Carvalho	Lisbon
South Africa	David P. Marais	Cape Town
Spain	Antonio Crespo Alvarez	Madrid
Sweden	Clarence Crafoord	Stockholm
Switzerland	Wilhelm Loeffler	Zurich
Uruguay	Fernando D. Gomez	Montevideo
Venezuela	Jose Ignacio Baldo	Caracas
Honorary Governor		
Italy	Maurizio Ascoli	Palermo
Governors		
Argentina	Raul F. Vaccarezza	Buenos Aires
Australia		
New South Wales	G. Bruce White	Sydney
South Australia	Darcy R. W. Cowan	Adelaide
Victoria	Alan H. Penington	Melbourne
Austria	Erhard F. Kux	Innsbruck
Belgium	Henry Durieu	Brussels
Brazil		
Bahia	Jose Silveira	Salvador
Minas Gerais	Orlando Cabral Motta	Belo Horizonte
Para	Epilogo de Campos	Para
Pernambuco	Joaquim Cavalcanti	Recife
Rio de Janeiro	Reginaldo Fernandes	Rio de Janeiro
Rio Grande do Sul	Carlos Bento	Porto Alegre
Sao Paulo	Jose Rosemberg	Sao Paulo
Canada		
British Columbia	W. Elliott Harrison	Vancouver
Eastern Provinces	J. J. Quinlan	Kentville, N. S.
Ontario	Hugo T. Ewart	Hamilton
Quebec	B. Guy Begin	Montreal
Western Provinces	Leslie Mullen	Calgary, Alberta
Ceylon	George E. Ranawake	Colombo
Chile		
Concepcion	Ildefonso Garreton Unda	Concepcion
Santiago	Armando Alonso Vial	Santiago
Valparaiso	Gilbert V. Zamorano	Valparaiso
China	Li Shu-Fan	Hong Kong
Colombia	Rafael J. Mejia	Medellin
Costa Rica	Raul Blanco Cervantes	San Jose
Cuba	Teodosio Valledor	Havana

Czechoslovakia	Jaroslav Jedlicka	Prague
Denmark	Kjeld Torning	Copenhagen
Dominican Republic	J. M. Moscoso Cordero	Trujillo
Eastern Pakistan	Mohammed Ibrahim	Dacca
Ecuador	Jorge A. Higgins	Guayaquil
Egypt	Abdel-Aziz Sami	Cairo
El Salvador	Jose Francisco Valiente	San Salvador
England		
Greater London	Richard R. Trail	London
Northern England	Peter W. Edwards	Shropshire
Finland	P. E. A. Nylander	Helsinki
France		
Bordeaux	F. Piechaud	Bordeaux
Lyon	Paul Santy	Lyon
Nantes	Paul Veran	Nantes
Paris	Maurice Bariety	Paris
Paris	Andre Meyer	Paris
Strasbourg	Eugene Vaucher	Strasbourg
Germany		
Cologne	H. W. Knipping	Cologne
Freiburg	Ludwig Heilmeyer	Freiburg
Munich	K. Bingold	Munich
West Berlin	Walter Unverricht	West Berlin
Wiesbaden	Hans Wurm	Wiesbaden
Greece	Basil Papanicolaou	Athens
Haiti	Louis Roy	Port-au-Prince
Honduras	Ramon Larios	Tegucigalpa
India		
Eastern India	P. K. Ghosh	Calcutta
Northern India	K. L. Wig	Punjab
Southern India	K. S. Sanjivi	Madras
Western India	Prag Nath Kapur	Delhi
Ireland	Victor M. Synge	Dublin
Israel	Juda M. Pauzner	Petach-Tikva
Italy		
Milan	Guiseppe Daddi	Milan
Naples	Vincenzo Monaldi	Naples
Palermo	Nicola Sanguigno	Palermo
Rome	Giovanni L'Eltore	Rome
Japan	Hidejiro Haruki	Tokyo
Korea	In Sung Kwak	Seoul
Lebanon	Papken S. Mugrditchian	Beirut
Mexico	Miguel Jimenez Sanchez	Mexico
Netherlands	M. R. H. van den Berg	Amsterdam
Nicaragua	Rene Vargas	Managua
Norway	Carl B. Semb	Oslo
Panama	Augustin A. Sosa	Panama City
Paraguay	Juan Max Boettner	Asuncion
Peru	Maximo Espinoza Galarza	Lima
Philippine Islands	Manuel Quisumbing, Sr.	San Pablo
Portugal	Carlos Alberto Vidal	Lisbon
Scotland	Robert Y. Keers	Aberdeenshire
South Africa		
Northern States	Maurice A. Pringle	Transvaal
Southern States	Theodore Schrire	Cape Town
Spain		
Barcelona	Luis Rosal	Barcelona
Bilbao	Carmelo Gil Turner	Bilbao
La Coruna	Alvaro Urgoiti	La Coruna
Madrid	Jose Abello	Madrid
Sweden		
Gothenburg	Gosta Birath	Gothenburg
Malmo	Helge B. Wulff	Malmo
Uppsala	Erik Hedvall	Uppsala
Switzerland		
Central Switzerland	Alfred Brunner	Zurich
West Switzerland	Maurice Gilbert	Geneva
Turkey	Tevfik Saglam	Istanbul
Uruguay	Armando Sarno	Montevideo
Venezuela		
Caracas	Julio Criollo Rivas	Caracas
Maracaibo	Pedro M. Iturbe	Maracaibo
Yugoslavia	Robert T. Neubauer	Bezana-Slovenija

The slate of officers as presented by the Committee on Nominations, upon motion from the floor, was duly elected.

EXECUTIVE COMMITTEE

Third International Congress on Diseases of the Chest

President: DR. LUIS ROSAL
Vice President: DR. CRISTOBAL MARTINEZ BORDIU
Secretary General: DR. ANTONIO CARALPS
Treasurer: DR. FRANCISCO COLL COLOME

DR. A. AMELL SANS
DR. E. BIETO REIMAN
DR. A. CASTELLA ESCABROS
DR. J. CORNUDELLA CAPDEVILA
DR. J. CIVIL INGLES
DR. M. GONZALEZ RIBAS
DR. P. GRANENA FIGUET
DR. RAIMUNDO FROUCHTMAN
DR. G. MANRESA FORMOSA
DR. F. MARGARIT TRAVERSAC
DR. J. ORIOL ANGUERA
DR. J. PALOU LLAUDET
DR. A. PURSELL MENGUEZ
DR. J. REVENTOS BORDOY
DR. JUAN BTA. ROSET COLL
DR. J. SANGLAS CASANOVAS
DR. LUIS SAYE
DR. T. SEIX MIRALTA
DR. J. TURELL GUMA
DR. C. XALABARDER PUIG

INTERNATIONAL COMMITTEE ON BCG

A meeting of the International Committee on BCG was held on Wednesday, October 6, at the Hospital Santa Cruz y San Pablo, Barcelona, Spain, at the time of the Third International Congress on Diseases of the Chest. In the absence of the Chairman, Dr. Robert J. Anderson, Washington, D. C., the meeting was presided over by Dr. Gumersindo Sayago, Cordoba, Argentina, the Vice-Chairman of the Committee. Members of the Committee present at the meeting were Drs. Erik Hedvall, Sweden, Andre Meyer, France, and Luis Saye, Spain. The meeting was attended by more than 100 interested physicians from various countries throughout the world.

The agenda for the meeting was as follows:

1) Vaccines
   a) Fresh and dried

BCG CONFERENCE

Physicians attending the BCG Conference held in Barcelona on Wednesday, October 6, 1954.

b) Production
c) Standardization
d) Control testing

2) Methods
a) Preliminary testing; obligatory or not.
b) Vaccination intradermal, percutaneous, oral.
c) Post testing

3) Effectiveness

At this session, Dr. Arnaldo Coro, Havana, Cuba, presented to Dr. Luis Saye the Finlay Medal from the Government of Cuba, for his outstanding contributions to medical science.

FOURTH INTERNATIONAL CONGRESS ON DISEASES OF THE CHEST

Upon invitation extended by the West German Republic at the time of the Third International Congress on Diseases of the Chest, held in Barcelona, Spain, October 4-8, 1954, the American College of Chest Physicians is pleased to announce that the Fourth International Congress will be held in that country in 1956.

Mr. Murray Kornfeld, the Executive Director of the College, traveled through Germany after the close of the Congress in Barcelona, and with the assistance of the Regent and Governors of the College in Germany, was able to fully inspect the convention facilities of each of the major cities in that country. A report of his visit to Germany was presented to the Board of Regents of the College at its semi-annual meeting held in Miami Beach, Florida, on November 29, and at that time it was unanimously agreed that

The German Officials meeting with officers of the College in Barcelona. Left to right: Dr. Ludwig Heilmeyer, Governor for Freiburg; Dr. H. W. Knipping, Governor for Cologne; Dr. Walter Unverricht, Governor for West Berlin; Dr. William A. Hudson, President; Dr. Joachim Hein, Schleswig-Holstein, Regent for Germany; Dr. Andrew L. Banyai, Chairman, Council on International Affairs; Dr. Hans Wurm, Governor for Wiesbaden; and Mr. Murray Kornfeld, Executive Director.

the City of Cologne, Germany, was best suited for the site of the 1956 International Congress. It is also planned for the delegates to visit many of the other cities in Germany which have extended invitations.

The organization of the Fourth International Congress on Diseases of the Chest will be supervised by an executive committee comprised of the Regent and the five Governors of the College for Germany. The committee members, whose names are as follows, have pledged their complete cooperation and support in the organization of the Congress.

Joachim Hein, Schleswig-Holstein (Regent), Chairman
Konrad Bingold, Munich
Ludwig Heilmeyer, Freiburg
H. W. Knipping, Cologne
Walter Unverricht, West Berlin
Hans Wurm, Wiesbaden

RECEPTION GIVEN IN MADRID

Dr. Antonio Crespo Alvarez, Regent of the College, Dr. Jose Abello Pascual, Governor, and the Marquis de Villaverde, Vice President of the Barcelona Congress, gave a reception at the Wellington Hotel, Madrid on September 30, for College members visiting the capitol city of Spain. The traditional "copa de Vino Espanol," which is the symbol of good fellowship, was the theme of the gathering. Each guest was presented with an album of photographs taken at the reception.

Dr. Cristobal Martinez Bordiu, the Marquis de Villaverde, Vice President of the Third International Congress on Diseases of the Chest, talking with Dr. Jose Abello, Governor of the College for Madrid, and Mr. Murray Kornfeld, Executive Director, at the reception given at the Wellington Hotel, Madrid.

College Chapter News

NEW YORK CHAPTER

The annual Clinical Session of the New York Chapter will be held at the Hotel New Yorker, New York City, February 17, 1955. The following program will be presented:

9:00 a.m. **"Justified and Unjustified Changes in the Treatment of Tuberculosis During the Age of Chemotherapy"**
Robert G. Bloch, M.D.
"Idiopathic Pulmonary Fibrosis and Related Conditions"
Louis E. Siltzbach, M.D.
"Treatment of Bullae of the Lungs"
William A. Zavod, M.D.
"Use of Intermittent Positive Pressure in the Treatment of Chronic Pulmonary Emphysema"
A. L. Loomis Bell, Jr., M.D.
"Some Effect of Diamox on Gas Exchange in Chronic Pulmonary Diseases"
Daniel S. Lukas, M.D.

12:00 noon **Luncheon Meeting**
"A Psychiatrist Considers the Chest Patient"
Alexander Reid Martin, M.D.

2:00 p.m. **Clinical-Pathologic Conference**
Chairman: Arthur Q. Penta, M.D.
Panel: Robert L. Yeager, M.D., Leonard J. Bristol, M.D., and Marvin Kuschner, M.D.
"Subphrenic Abscess—Differential Diagnosis and Treatment"
Charles B. Ripstein, M.D.
"Some Clinical Applications of Angiocardiography and Cardiac Catherization"
Irving G. Kroop, M.D.
"Displacements of the Barium-filled Esophagus by Cardiovascular Lesions"
Nathaniel E. Reich, M.D., and David E. Ehrlich, M.D.

A five minute question period will be allotted to each topic after the speaker has completed his presentation.

PACIFIC NORTHWEST CHAPTER

The following officers were elected at the annual meeting of the Pacific Northwest Chapter, held in Portland, Oregon, November 12:

President.....Herbert S. Stalker, Vancouver, British Columbia
Vice-President.....Norman Arcese, Seattle, Washington
Secretary-Treasurer....William G. Trapp, Vancouver, British Columbia

NEW ENGLAND CHAPTER

Listed below are the dates and programs for the forthcoming monthly meetings of the New England Chapter. Meetings are held at the New England Deaconess Hospital, Boston.

January 19 — 4:00 p.m.
"Modern Concepts in Treatment of Pulmonary Tuberculosis"
Roger S. Mitchell, M.D.

February 16 — 4:00 p.m.
"The Place of Physiological Studies in Pulmonary Tuberculosis
Giles Filley, M.D.

March 16 — 4:00 p.m.
"Pathology of Tuberculosis Before and After the Era of Chemotherapy"
Oscar Auerbach, M.D.

April 20 — 4:00 p.m.
"Clinical Implications of Anomalies of the Pulmonary Circulation"
Irving M. Madoff, M.D.

ILLINOIS CHAPTER

A joint meeting of the Illinois Chapter of the College and the Chicago Tuberculosis Society will be held on Friday evening, January 28, at the St. Clair Hotel, Chicago. The guest speaker will be Professor L. D. Eerland, Chief of the Department of Thoracic Surgery at the University of Groningen, Groningen, The Netherlands. The title of Professor Eerland's presentation is "Surgical Resection in Pulmonary Tuberculosis; Review of 1000 Cases." There will be a fellowship hour at 6:30 p.m. to be followed by dinner and the scientific session.

BARCELONA CHAPTER

The Barcelona (Spain) Chapter met on November 16, 1954 and elected the following officers:

President.....Jose Cornudella Capdevila
Secretary.....Raimundo Frouchtman
Treasurer.....Francisco Coll Colome

ARGENTINE CHAPTER

The Argentine Chapter held its annual meeting in Rosario, December 11-12, at which time the following officers were elected:

President.....Juan B. Rocca, Cordoba
Vice President.....Francisco Arambarri, Eva Peron
Secretary-Treasurer.....Jose Antonio Perez, Cordoba

QUEBEC CHAPTER

The Quebec Chapter recently sponsored a joint meeting of the Montreal Medico-Chirurgical Society and the Societe de Phtisiologie de Quebec at the Royal Edward Laurentian Hospital, Ste. Agathe-des-Monts, Quebec. Members of the College who presented papers at the meeting are: Doctors Roger Lachance, Maurice Doray, Ruben Laurier, M. Allan Hickey, Philip Edwards, George Lenis, Basil Cuddihy, and J. F. Meakins.

MOTION PICTURE SESSION ON DISEASES OF THE CHEST

Physicians having new motion pictures on diseases of the chest are invited to send their films for review by the Committee on Motion Pictures of the American College of Chest Physicians for official approval and for consideration for showing at the motion picture session to be held in connection with the 21st Annual Meeting of the College in Atlantic City, June 2-5, 1955. Film data blanks may be secured upon request. Please address films and inquiries to Dr. Paul H. Holinger, Chairman, Committee on Motion Pictures, American College of Chest Physicians, 112 East Chestnut Street, Chicago 11, Illinois. Other members of the committee are: Houck E. Bolton, Philadelphia, Pennsylvania; Alfred Goldman, Los Angeles, California; H. Corwin Hinshaw, San Francisco, California; David H. Waterman, Knoxville, Tennessee; and Francis M. Woods, Brookline, Massachusetts.

NEWS NOTES

Dr. Roberts Davies, formerly of Seattle, Washington, has been appointed Director of the Florida State Tuberculosis Board.

Dr. Harold A. Lyons, Brooklyn, New York, recently lectured on "Differential Diagnosis of Chest Disease" at the Symposium on Chronic Pulmonary Disease for General Practitioners.

1955 Prize Essay Contest

The American College of Chest Physicians will offer three cash awards for the best essays written on any phase relating to the diagnosis and treatment of chest diseases (heart and/or lungs). First prize will be $250; Second prize, $100; and Third prize, $50. Each winner will also be awarded a certificate of merit. The contest is open to undergraduate medical students throughout the world. The deadline for receipt of manuscripts is April 10, 1955 and instructions for their preparation are as follows:

1) Five copies of the manuscript typewritten in English (double spaced) should be submitted to the Committee on College Essay, American College of Chest Physicians, 112 East Chestnut Street, Chicago 11, Illinois.
2) The only means of identification of the author shall be a motto or other device on the title page and a sealed envelope bearing the same motto on the outside enclosing the name and address of the author.
3) A letter from the Dean or Chairman of the Department of Medicine or Surgery of the medical school certifying that the author is a student at his school.

The Board of Regents has recommended that members of the College affiliated with medical schools be urged to bring the contest to the attention of the student body at their respective schools.

POSTGRADUATE COURSE ON DISEASES OF THE CHEST

The New Jersey Chapter of the College will sponsor its second postgraduate course on diseases of the chest, designed for the general practitioner, at the Hotel Essex House in Newark on consecutive Wednesday afternoons during March, 1955, namely: March 9, 16, 23, and 30. Tuition is $25. Applications and further information may be obtained from Dr. A. Abram Peckman, 2511 Hudson Boulevard, Jersey City 4, New Jersey, director of the postgraduate course.

ANNOUNCEMENTS

The 15th Congress on Industrial Health, sponsored by the Council on Industrial Health of the American Medical Association, will be held at the Shoreham Hotel, Washington, D. C., January 25-26, 1955.

Dr. Leonard A. Scheele, Surgeon General of the Public Health Service, U. S. Department of Health, Education, and Welfare, announced approval of Federal grants for 972 medical research projects, totaling $10,275,533, for basic and applied research in many of the major diseases. The grants were approved during recent meetings of the seven National Advisory Councils. Two hundred and eighty-nine of the awards, totaling $3,079,840, were for new research projects, and 683, totaling $7,195,693, were for continuation of existing projects.

Successful treatment of cardiospasm with drugs, employing a new "topical anesthetic-spasmolytic" has been reported. The preparation used was an experimental liquid form of the drug Dactil which has been recently made available in capsules by Lakeside Laboratories of Milwaukee, Wisconsin.

The American Medical Association recently awarded a special citation to Smith, Kline and French Laboratories of Philadelphia for "pioneering use of television in bettering the health of the nation." This is the first award ever made by the American Medical Association to a commercial house.

BOOK REVIEWS

THE HEART BEAT, by Aldo A. Luisada, M.D., Chicago, Illinois. Published by Paul B. Hoeber, New York, 1953. Pp. 527. Price, $12.00.

The purpose of this book is to correlate data concerning the various graphic methods now available for recording the heart beat. Tracings of electrical changes, pulsations, pressures, sounds and other phenomena resulting from cardiovascular action are discussed and their clinical applications in common types of heart disease are considered. By means of excellent organization, clear writing and ample illustrations, Dr. Luisada provides a wealth of easily understandable information on the numerous techniques developed during the past quarter-century to facilitate cardiac diagnosis. The discussion of heart sounds is particularly commendable. Every cardiologist should find "The Heart Beat" a worthwhile addition to his library. As new techniques for cardiac study become available, it is hoped that new editions will be published to keep this valuable reference book up-to-date.

Myron Prinzmetal, M.D.

A PRACTICE OF THORACIC SURGERY, by A. L. d'Abreu, M.D. Published by Williams & Wilkins Co., Baltimore, 1953.

This text contains in it most of the forward progressive advances in thoracic and cardiac surgery. It is well printed on excellent paper and very well documented with illustrations.

In its organization there are seven parts. Part I—Anatomical and Physiological Considerations. This section also includes a division on pre- and postoperative care and general operative technique. For those neophytes who would establish a new thoracic surgical service in a hospital, this section would be extremely informative. Part II—The Surgery of Pyogenic Infection—is illustrated with excellent bronchograms, and the newer methods such as decortication for empyema are well described. Part III—Pulmonary Tuberculosis—is worthwhile not only for thoracic surgeons but also for phthisiologists. An excellent perspective of the progress of resection in tuberculosis is stated by such a sentence "The immediate results of resections are so pleasing to surgeon and patient that the gate into a field of almost limitless extent is invitingly open." The thoroughness with which this part is managed is attested to by such sub-headings: "Lesions more suitable for resection than collapse measures"; "Lesions that may be suitable for resection or collapse methods or a combination of both"; "Resection for lower lobe cavities"; "Emergency resection"; "Summary of the indications for resection"; etc. Part IV is Neoplasms of the Lung and Trachea. It is interesting to note that for post pneumonectomy, phrenic paralysis and pneumoperitoneum is practiced. In this discussion, Dr. d'Abreu rightfully points out that while many innocent tumors are operated upon, those such as leiomyomas, hamartomas, fibromas and lipomas do not need resection of a whole lung for its removal, and he points up that in cases of doubt as to the innocence of the tumor one should err on the side of the lesser resection rather than the greater. In his discussion of bronchial adenoma, he is inclined to underrate slightly the invasive and malignant qualities of this group of tumors but rightfully prefers surgical resection of the tumor to bronchoscopic removal. Part V is the Surgery of the Mediastinum. A separate chapter is devoted to Mediastinal Tumors. Part VI—Some Miscellaneous Conditions—includes among other things the surgical aspects of pulmonary emphysema and asthma and injuries and penetrating wounds of the chest. Finally there is Part VII—a relatively new part, Thoraco-Abdominal Surgery. This brings the book up to date even including a section on porto-caval anastomosis in the treatment of portal hypertension.

There should be no hesitancy in recommending this book to the practicing thoracic surgeon, the general surgeon interested in thoracic surgery, phthisiologists, cardiologists, and medical students.

The book has 591 pages, an excellent index, and a satisfactory bibliography at the end of each chapter.

Alfred Goldman, M.D.

CALENDAR OF EVENTS

NATIONAL AND INTERNATIONAL MEETINGS

21st Annual Meeting, American College of Chest Physicians
Ambassador Hotel, Atlantic City, New Jersey, June 2-5, 1955

Fourth International Congress on Diseases of the Chest
Council on International Affairs, American College of Chest Physicians
Cologne, Germany, 1956

POSTGRADUATE COURSE

8th Annual Postgraduate Course on Diseases of the Chest
Bellevue-Stratford Hotel, Philadelphia, March 7-11, 1955

CHAPTER MEETING

Clinical Session, New York State Chapter
New York City, February 17, 1955

MEDICAL SERVICE BUREAU

Positions Wanted

Tuberculosis hospital position wanted. American male, white, single, health good. Original license Kentucky. Years of hospital experience: U. S. Public Health Service, 3; general, 3; tuberculosis, 10. Available soon. Please address all inquiries to Box 289B, American College of Chest Physicians, 112 East Chestnut Street, Chicago 11, Illinois.

Position Available

Physicians wanted for predominantly tuberculosis hospital of 500 beds. Previous experience not required. Good opportunity. Salary determined by Veterans Administration schedule. Apply to Manager, VA Hospital, San Fernando, California.

Resident Fellows

The Committee on Resident Fellowships in Chest Diseases of the American College of Chest Physicians has recently received and approved applications for residencies from physicians whose biographical data appear below. In accordance with regulations established by the United States Department of State, these physicians will return to their respective countries at the completion of the prescribed training period.

The Committee on Resident Fellowships will be pleased to forward for your consideration any applications which you may wish to review. Please address your inquiries to: Committee on Resident Fellowships, American College of Chest Physicians, 112 East Chestnut Street, Chicago 11, Illinois.

OMS, Cairo, Egypt, age 30, single; interested in medical aspects of chest diseases; Medical school: Kasr El Ainy Faculty of Medicine; Internship: University Hospital; Residency: Chest Section, University Hospital, Heliopolis Hospital; Postgraduate: Mobtdian Dispensary; Presently: clinical instructor, Chest Section, Faculty of Medicine; speaks English and French; desires one year postgraduate training.

MFD, Polis, Cyprus (presently in United States) age 37, married; interested in cardio-pulmonary physiology and pulmonary diseases; Medical school: University of Istanbul (Turkey) Faculty of Medicine; Internship and residencies: Institute of Pathological Anatomy; Postgraduate: various postgraduate courses in USA; Presently: resident in internal medicine, Pennsylvania; speaks English; available soon for one year's additional training.

SYH, Kaishiung, Formosa, age 34, married; interested in training in thoracic surgery; Medical school: Army Medical School (Formosa); Internship and residency: College Teaching Hospital; Presently: visiting surgeon, 2nd General Hospital; Speaks English, desires 1-2 years training.

HJR, Seoul, Korea, age 29, married; interested in medical aspects of chest diseases; Medical school: Seoul National University Medical College; Internship and residency: Seoul National University Hospital and Korean Army; Speaks English, seeks three years residency training.

GOO, Cali, Colombia, age 46, married; interested in tuberculosis and nontuberculous chest diseases; Medical school: School of Medicine of Antioquia; Internship: Hospital San Juan de Dios; Presently: private practice of medicine; Speaks English, desires six months training.

KMY, Masan, Korea, age 35, married, interested in hospital management (tuberculosis); Medical school: Severance Union Medical College; Internship and residency: St. Maria Hospital, Dong Ai Tuberculosis Hospital; Presently: Superintendent and Medical Director, Tuberculosis Sanatorium; Speaks English; seeks one year of training.

Preparation of Manuscripts

DISEASES OF THE CHEST, the official journal of the American College of Chest Physicians, publishes manuscripts dealing with tuberculosis, non-tuberculous diseases of the chest and cardiovascular diseases. Kindly send all manuscripts to:

JAY ARTHUR MYERS, M.D., Editor-in-Chief
1316 Mayo Memorial Building
University of Minnesota
Minneapolis 14, Minnesota

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1) All manuscripts should be typewritten on white paper, 8 to 8½ by 11 inches, double or triple spaced. Tables may be single spaced, if necessary. Only one side of the paper should be used. The original copy must be submitted, and the carbon copy should be retained by the author to compare with the proofs. Manuscripts must be original, not published elsewhere, except when special permission is granted by the Editorial Board of *Diseases of the Chest.*

2) The pages should be numbered, preferably at the top right-hand corner. The name of the author should appear on each page of manuscript and on each illustration, chart and table.

3) All dates should be written as follows: *August 25, 1951*—not 8-25-51.

4) Abbreviations should not be used in the manuscript, such as R. U. L., which should be written as *right upper lobe.*

5) Illustrations should be unmounted and appropriately numbered in pencil on the back. Legends should be listed on a separate sheet at the end of the manuscript. Photographs should be black and white glossy prints, not smaller than 3 x 3 nor larger than 5 x 7 inches. Charts and graphs should be drawn on white paper with black India ink. Whenever possible, they should be made by professional medical illustrators.

6) Written permission must accompany identifiable photographs of patients.

7) Four illustrations may be published with each article without charge. Additional photographs, when approved by the Editorial Board, may be published upon payment by the authors or the institution where the work was done.

8) Usually, long lists of references are not necessary or desirable. For most manuscripts, 10 well selected references are adequate.

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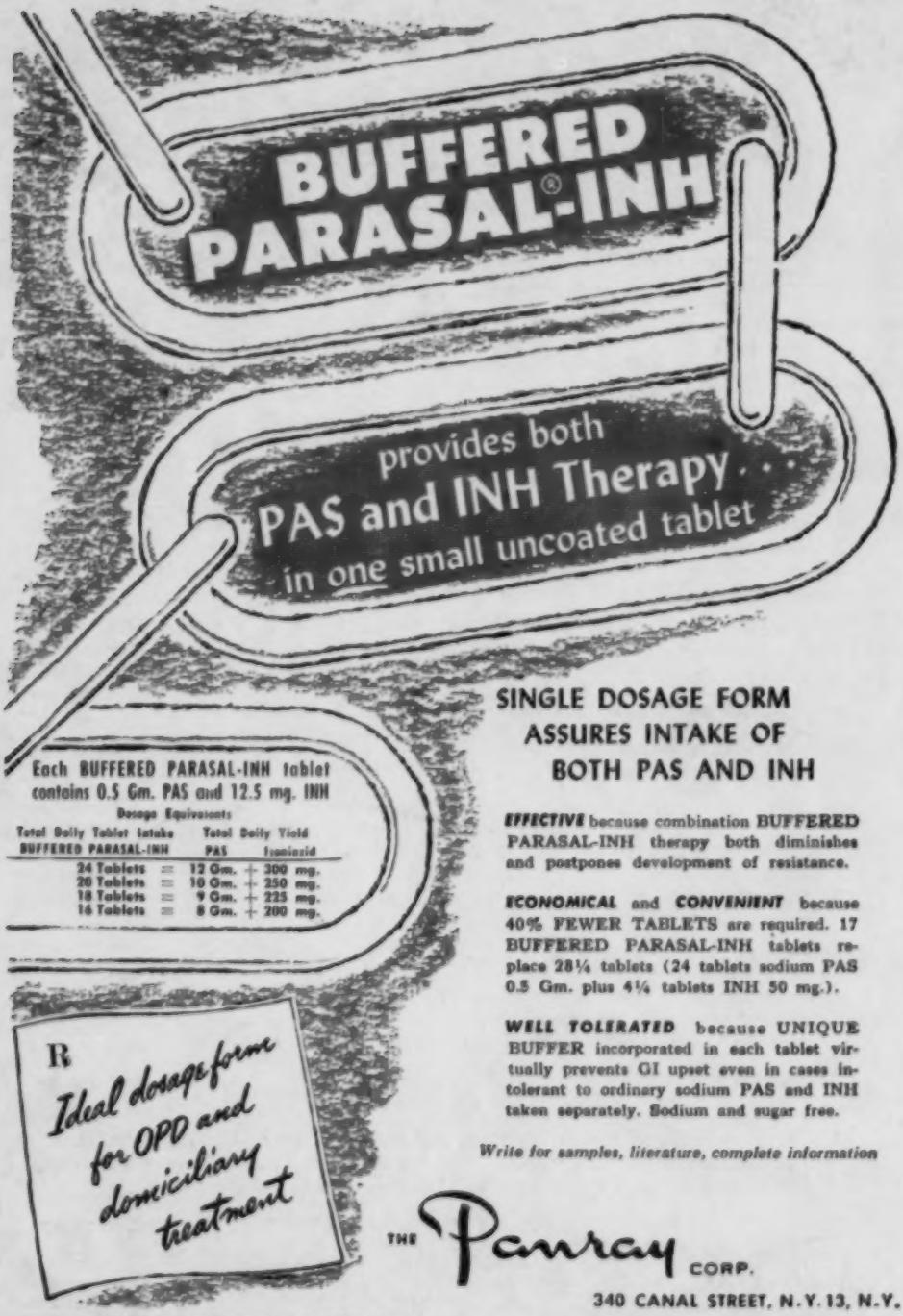

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